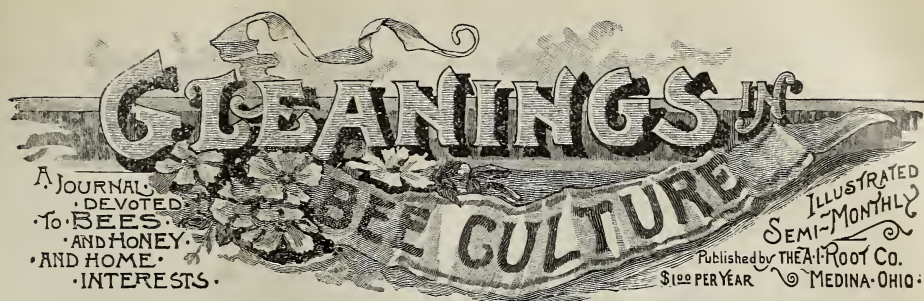


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Vol. XXIII.

FEB. 1, 1895.

No. 3.



I JUST BELIEVE that C. Davenport has given a capital plan for mice, p. 54, to give them such a variety.

HONEY SOURING in the hive is something I think I never heard of till lately. How far north has it been known?

THAT STATEMENT on p. 45, that E. France has 140 colonies in the home yard, makes me all alive to know whether that's the regular thing, and what supports so many.

A BRIGHT AMERICAN girl was asked in England what was done with so much fruit in this country. She replied, "Oh! we eat what we can, and we can what we can't."

IS EUCALYPTUS, that Prof. Cook tells about, p. 52, the same as in Australia that Australians say is so fine, and that bee-keepers in England will not admit it fit for the table?

FROM SWITZERLAND come reports of two cases of fecundation of the queen during the act of swarming. I had supposed it was quite a common thing with after-swarms. How is it?

I'M GLAD TO KNOW that cement-coated nails are better than rusted. Sometimes I rust them purposely; but it's troublesome to do it well, and, besides, I don't like the looks of the rusty nailheads.

"ALWAYS make a new colony a full colony, especially if made late in the season," says E. France, p. 44, and it's worth saying again, both for the sake of getting that dash out, and emphasizing it for beginners.

ABOUT 150 COLONIES of live bees were at the great German convention and exposition, nearly all black or German bees. Somehow black bees have more friends in England and on the continent than in this country.

EDITOR LEAHY tells what a good time he had with J. T. Calvert, of the A. I. Root Co., at a visit on the way from St. Joe. Now, you can

fling all the mud you like at the "mutual-admiration" business, but that sort of talk makes a good bit nicer reading than mud-flinging.

A GOOD POINT in favor of laws against adulteration is given by S. E. Miller, in *Progressive*. It gives the public more confidence in purity of product. Lately, in a region where good cheese-factories abound in Illinois, I found New York cheese on the table, simply because New York laws were more strict as to pure cheese.

AFTER READING what E. France says, the old question comes back whether covered sealed covers may not be all right, and *uncovered* sealed covers all wrong. His covers have straw over them. Is there nothing but the sky over yours? [No, sir. There's a good big cushion and cover over them. Our sealed covers have always been so protected in winter.—ED.]

"FRUITS produced by self-pollination are quite different from those produced by cross-fertilization. Few varieties of apples will self-fertilize to any extent. The chief agents for fertilization are insects, and honey-bees are among the best. Every fruit-grower should keep some bees to fertilize his blossoms, or see that his neighbor does."—*Green's Fruit-grower*.

A SYMPOSIUM of six articles on five-banded bees occupies most of the *Progressive* for January, leaving the impression that there are five-banded and five-banded, or, as Hutchinson expresses it, "the dark, leather-colored bees are, as a rule, the better workers, but the brighter-colored bee *may* be just as good workers as their darker sisters . . . and some strains are." [Them's my sentiments, and I think they agree fairly with what I have said.—ED.]

"THE HONEY-BEE is not able to pierce the skin of fruits; but they have the power of getting in between the joints, as one might say, consequently they manage to work in between the pips of the raspberry, and also into the grape, near its junction, and in this way crops of grapes and raspberries are wholly ruined by bees." That's what Meehans' *Monthly* says. Now, will that good monthly tell us just how it found that out?

THAT WAX is secreted by bees, and not gathered somewhere outside the hives, was, according to Cowan, discovered as early as 1684 by Martin John, and soon after by Thorley; but no great notice seems to have been taken of it till it was rediscovered by a Lusatian peasant whose name, Cowan says, is, unfortunately, not given. Herr Beck, in Gravenhorst's *Bienenzeitung*, gives H. C. Horebostel as the name of this man to be remembered for his discovery in 1720.

THE DOCTRINE that each nurse-bee prepares food for larvæ of a particular age gets a black eye from Gravenhorst. He thinks it will not do to say that a bee 9 days old is too old to feed a larva one or two days old, because, when brood-rearing commences in spring there are none but old bees present. Also, after a colony has been long queenless in summer the larvæ are well fed on the introduction of a queen. Dzierzon, in Noerdingen *Bienenzeitung*, pokes fun at the whole idea.

FOUL BROOD raged for two years in the apiary of Herr Fulde, in spite of all efforts at cure; then every two or three days a few drops of the new disinfectant, lysol, was given in the bees' food, and it worked like a charm, all traces of the disease disappearing for good in three weeks. Now, what's lysol? and will it work in the English language as well as in the German? [I should be interested also, in knowing whether the disease stayed away. Perhaps Herr Gravenhorst will answer these questions.—ED.]

HERR REEPEN, the great German gleaner, sturdily opposes the idea that workers carry eggs or larvæ from one cell to another, and yet he has most faithfully given all the testimony favoring such belief. He now sums up as advocates, Langstroth, Wagner, Root, Abbott, Americans; Editors Bertrand, Wathélet, French; but Germans and English seem to be absent from the list. [I have personally seen a worker carry an egg (not larva), but what it did with it I can not be positive. I was not interested at the time, and so did not take the pains to follow the bee up.—ED.]

YE EDITOR is a little too sweeping when he says, p. 23, that color will detract from both prolificness and the honey crop. Best qualities don't necessarily go with any shade of color. I like leather color, not because that color makes good bees, but because good bees happen to have that color. [The last sentence taken alone (and to which you doubtless refer) does sound a little strong; but when taken in connection with what precedes, and especially with what I have said aforetime on this same question, I don't think my meaning will be misunderstood. What I meant was that it was *liable*, under the present craze, to detract from both of the qualities—prolificness and honey-gathering, because, in the selection of the one thing, color, the other things are left out of the

consideration; or, rather, the undesirable traits are allowed to creep in.—ED.]



CAMPING, FISHING, CUTTING BEE-TREES, ETC.

HOW TO GET BEES OUT OF TREES WITH FEW OR NO STINGS; A QUESTION FOR C. A. HATCH TO ANSWER.

By E. France.

I have been in the habit of going to the Mississippi River and camping out, or living in a tent, from four to eight weeks, for the last five years. I go for sport and health. I think it does me good, and it gives me rest from other labor. My wife has gone with me three years, and she stays about five or six weeks, then takes the train and comes home, and I stay two or three weeks longer. I usually stay until it gets pretty cold, as we get better fish after the weather gets cold enough to use an overcoat and mittens.

I have a partner, a Galena man, who camps with me and stays as long as I do. We each have a boat and a tent, a stove in the tents, good beds, and camp-outfit. We are as comfortable there as at home, with plenty of fresh air. We catch catfish, buffalo, bass, pike, and a few other kinds. We fish with rod and line. At that time of the year we catch mostly pike, called there salmon, but they are *not* salmon.

I was feeling pretty miserable—tired out, no appetite. After I had been there three days I thought I should have to give it up and go home. But I stayed; and after I had been there a week I got stronger, and got a "river appetite," as I call it. After that I was all right, and able to handle my boat without tiring me as it did at first. I went down the 20th of September, and came back the 12th of November; but as the weather turned out, the best fishing was after I came home. As for fish, I got enough. I salted a 15-gallon keg full, and sent home once a week a good market-bas-ket full.

With the rest of the fun I helped to cut two bee-trees. I was down there, and stayed a week with Newel France and his whole family in August. I found those two bee-trees on an island. The island belonged to an old fisherman. He lived in a cabin on the island—the same island that we camped on later. I showed him the trees, and told him I would help him cut them when I came down in the fall to fish. So when I went in September I took along a smoker and brush-broom, and a paper of tobacco. You see I wanted a good strong smoke, as the trees had to be chopped down,

and the bees would get a terrible jar, and would be mad.

After we had been in camp about three weeks the old man came to our camp one day and said the boys had come to cut the bee-trees. The boys were the old man's sons, three of them, and all married. The old man said the boys were chopping down one of the trees. "That won't do," I said. "Go to them as soon as you can, and tell them not to fall the tree until I get there." It was very important that I should be there when the tree fell. He got to the tree in time to stop the chopping. I got together what things I wanted—smoker, brush-broom, pail for honey, veil in my pocket, etc. One of our fishing partners went along to see me handle the bees, as he had cut a tree once, and got nearly stung to death.

When we got to the tree we found the boys waiting for us, with the tree still standing. I filled my smoker and lighted it; and as this tree had a good many large limbs it was not likely to fall hard, so I did not put on my veil. "All ready! let her drop!" A few licks with the ax, and down it came. Just as soon as I could get to the top of the tree I was there blowing my smoke into the entrance. Very few bees had got out, and what few there were out went up to where the top of the tree had been—out of our way.

The next thing to do was to get out the honey. "Come on, boys, with the ax." No reply. I went back to the stump. No one was in sight. I halloed; no answer. I took an ax and went back into the top of the tree, and smoked the bees a little more; then I got to work cutting away the brush, getting ready to open up the tree. Directly I heard the old man call from the brush, back beyond the stump. "Mine crasus, man, de pees eat you up."

"No," I said; "get the other ax and come here and help chop. The bees don't sting me, and they won't sting you."

"I'm nod so sure. I pe so 'fraid of dem pees."

"Never mind; come on; if they sting you when you get here I will chop them out."

He came and helped me get out the honey; But those brave boys of his never got nearer than the stump of the tree. My fishing partner came and helped some, after some coaxing. We got two large dishpans full of nice honey—not smashed up much. We swept the bees off the combs a piece at a time, and left them scattered all over the ground. I never saw them after. The old man said the bees after that gathered in a bunch on the ground, and he wanted to save them. I told him to set a hive over the bunch, and the bees would go up into it. He did that, and then took the bees home.

"Now we will cut the other tree." It was easy to cut, as it was rotten at the base. This tree stood alone, and had not many limbs—nothing to break the fall. The bees were away up in the top. I got my smoker ready, and then

got out my veil and put it on. "Vell, vell! now vot you going to do now?" the old man said.

"Well," said I, "this is a horse of another color. You see, this tree has got to fall hard, and may be it will split wide open and throw the bees all over the ground. In that case it will be hard to get the bees to behave, as I can not smoke them if they are scattered; so I will put on this veil, then the bees can not sting me in the face."

"Ya, ya; I see now. Dat is a nice ting. Vy you not use him pefore?"

"Why, the other tree fell easy, and I did not have to use the veil. I very seldom use a veil; but I may have to with this tree."

By this time the tree came down crash on the ground. I ran into the top. The tree was not smashed open. I soon found the entrance, and smoked the bees. There were but few coming out. The hard jar had nearly paralyzed them. I went back to the bushes where the men were hid, and put the veil on the old man, and we went and opened the tree and took out the honey. All together we got a large wash-tub nearly full of nice capped honey. I had brought along a six-quart pail, and I filled it with nice honey to use in camp; but when we had all the honey out of the trees and in the tub, and were ready to leave, the old man said, "Vell, Vrance, what you got to put your part of de honey in?"

"Why," said I, "I have this little tin pail."

"Yes, yes; pud dat von't holt half af de hon-ik."

"Oh! well, this is all I want."

You see, as I had found the trees and helped take the honey, he expected me to have half of the honey. When I told him that little pailful was all I wanted, he looked at the tub and hefted one side of it. He said, "*Honey, honey, honey*, all vinter—kee-e-e! *honey* all vinter!" and he was as happy as a king.

"Vell," said he, "it do beat all how you handle dose pees. I tinks you know all 'poud dem pees."

Now that we have the trees cut and honey disposed of I want to mention a few things that I noticed. The first tree cut, I would call the colony in it two years old; at least, they had wintered there one winter. The opening in the tree, or the place occupied by the bees, was five feet up and down, or, rather, down, as the entrance into the tree was at the side of the top. The entrance was fully two feet long—a large crack two inches wide at the top end, and running to a point at the lower end—plenty of ventilation at top, none at the bottom. The cavity was small—room in the largest place for only five combs—about eight inches wide. That part of the tree, or hive, was about two feet long. At the upper end there was room for only two combs, and at the bottom for three—pretty small hive, but it was tall. Every comb was full of honey except one piece at the lower

end two by three inches, that had capped brood in it.

The second tree cut was a larger hive—six feet high, top and bottom running to a point like the other; lower end, four combs; top only one comb for the last six inches; the middle of the hive had eight combs $2\frac{1}{2}$ feet; entrance, a round knot-hole $1\frac{1}{2}$ inches in diameter, just below the largest part of the hive. This colony had brood in one comb, three inches wide and six inches high, and was also in the very lowest part of the hive. Those trees were cut about the middle of October, and in height were equal to a six or seven story L. hive. I will ask Mr. C. A. Hatch how it happens that all the brood there was in those two hives was at the very bottom. He says it is easy to get the queen to go up, but not down. It is just as easy for me to see how the queen will go down as readily as up. I always find the queen, in the spring, laying in the highest empty comb, or just below the honey; and if left to themselves she will keep the same place all summer—that is, just below the honey; when the honey-flow comes on she will be driven down and down; and if the honey continues to come she will be driven to the very bottom. In the same way, the queen will follow the honey up when there is none coming in. The bees use the lowest honey first; so the queen works up and down according to circumstances, but keeps just below the honey.

Platteville, Wis.

BEE-ESCAPES.

THE DAYTON ESCAPE CRITICISED; NO ADVANTAGE IN HAVING MORE THAN ONE WAY OF ESCAPE: AN INTERESTING AND VALUABLE ARTICLE.

By R. & F. C. Porter.

Mr. Editor:—In reference to the Dayton escape, and his articles regarding it and escapes in general, permit us to say that, when the article describing it appeared in GLEANINGS, and you asked for the experience of others with it or similar devices, we refrained from responding because we dislike exceedingly to do any thing that savors of "ax-grinding," and do not now wish to say any thing for publication; but in view of what he says in Jan. 1 GLEANINGS we think a few words with you personally regarding the matter may not be out of place.

Mr. Dayton's theories are, perhaps, plausible; but some of these, as well as the claims he makes for his device, and his statement of the results of his experiments with the Porter escape, are at variance with our experience.

In 1890 we tested many forms of trap-door escapes; but all, sooner or later, proved to be impracticable for general use, on account of difficulties arising from propolis and corrosion, and none were found to show any points of superiority over properly made spring escapes.

The form inclosed proved the most nearly successful of any; but in occasional instances, this too was propolized so as to prevent its working.

For experimentation, a number of boards were filled with this form, some with one escape opening into the brood-chamber in the usual way, some having one opening into the brood-chamber, and in addition thereto having one placed in the rim or cleat of the board, opening outside the hive, and admitting light directly to the super, both ends of the body of the escape being open, and some having an escape only in the rim of the board. All of these were carefully tested, comparatively. The first arrangement was found equal to the other two in all respects, and superior in some. The addition of an escape to the rim of the board, and opening outside the hive, admitting light to the super, was not found to shorten the time occupied by the bees in leaving the super in any instance; but, on the contrary, it proved objectionable on account of attracting robber-bees, and causing disturbance of the apiary. With the same device, and at the same time, Mr. S. A. Shuck, of Liverpool, Ill., made for us substantially the same experiments that we made, and with the same results. You will notice that the swinging-gate, or door, in the escape sent you is so delicate that bees in passing under it will pay practically no attention to it. In fact, it is far more delicate than is necessary.

The following clipping from the directions sent out with the Porter escape is a concise statement of the reason that it is made in its present form:

One escape to the board is sufficient. Extensive experiments have shown that a larger number, or one having greater exit capacity, will do the work no more rapidly. Also that the circulation of air through the escape supplies the super at all times with sufficient ventilation.

Before the permanent form of the Porter escape was finally decided on, neither time, pains, nor expense was spared to determine the best possible form. For an entire season it was carefully tested by several expert bee-keepers in a large number of different forms, embracing those in which the bees passed out under the springs, those in which they passed out over them, those in which they passed out between them, those in which they passed out between them and the sides of the escape, those having exits varying in number from one to a dozen, and those in which perforated tin was used for the tops, also for both tops and bodies. After carefully considering the excellencies and defects of all, the form that is now known to the public was decided on as in every way the best; and the universal favor with which it has been received after large and extensive use in all parts of the world leads us to believe that we have made no mistake in our choice; but if we ever find that we have, we shall be only too willing to change it.

On August 4, 1893, after reading Mr. Dayton's criticisms of escapes in the *Review*, we took the pains to send him by mail four Porter escapes

of the usual form—two similar to these, but having exits at both ends, and one with fifteen exits in which the bees passed out under the springs, and we wrote him, asking him, if he cared to do so, to place the four in a board, and test them comparatively, with one of the same kind in a board, and also with the other forms sent, and favor us with the result. But as yet he has taken no notice of either the escape or the letter. We can not doubt that both reached him, as both have request for return if not delivered.

At the same time, to Mr. R. C. Akin, of Colorado, who had also been criticising escapes, we sent a package of escapes identical to that sent to Mr. Dayton. Mr. A. made the test wished for, and reported that he could see no advantage in the large forms, or in using more than one to a board.

Lewistown, Ill., Jan. 5.

[If Mr. Dayton received the package of escapes referred to, perhaps he would have no objection to reporting the result of his experiments with them in these columns. I should be glad to have him do so whenever he is prepared to make such report.]

It occurs to me that it would not be a bad idea to send a similar package of escapes to R. L. Taylor, to be tested at the Michigan Experiment Station. We will pay the expense of the escapes, and also of those sent by Mr. Dayton to the same place.—ED.]

HONEY-HOUSES FOR OUT-APIARIES.

HOW PRACTICED BY W. L. COGGSHALL.
PLAIN, PRACTICAL INSTRUCTIONS; MANAGEMENT OF OUT-YARDS IN GENERAL.

By Harry S. Howe.

It seems to me as though the slight expense of a permanent building is more than balanced by the advantages of having a place where the extractor and other things can be kept under cover and ready for instant use. At the present prices of extracted honey we have got to reduce the work to the fewest possible motions and to the least possible expense if we are to make it profitable.

By having permanent buildings at the out-yards, any one can save a great deal of the expense of transportation. If we are to do as Mr. Coggshall does, and visit two or three yards in a day, and take three or four thousand pounds of honey, we must have the work reduced to a perfect system.

After one or two trips with a team and heavy wagon in the spring, to take the kegs, etc., to the yards, the trips can be made in a buggy, if two or three are to go, or on the wheel if but one, until time to draw away the honey in the fall.

As Mr. C. and I have worked together, one puts out the horse while the other lights the smoker and prepares for work in the yard. By the time the horse is cared for the empty kegs for the day's work have been tested by blowing into them, and we are ready to commence to

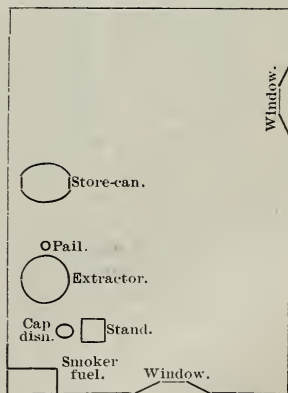
take off the honey. When the yard has been gone over, it is an equally short job to pick up and start. One gets the horse while the other goes through the yard and sees that no fire has been left, and attends to any other little matters. Then away we go, three or four miles, to the next one.

Nearly every thing that is likely to be used at the yard is kept there, so there is no forgetting to take some important thing.

Mr. C. wears his veil in his hat all the season, consequently it is always ready. When there is but little to do, one man can get to the yard on a wheel or in a buggy, and go over it very rapidly, if every thing he is to use is there handy.

Mr. C.'s nine houses and my two are all very nearly alike. They are 12x16, and 8 feet high at the eaves, made of rough lumber, but having good floors. Sixteen-foot boards cut in two make the sides; twelve-foot boards the floor, which must have a good foundation in order to support the weight of the honey, without sagging. The door should be wide enough for the cart or wheelbarrow, or whatever you use to carry in the honey, to go through easily. The windows are the size of one large sash, and slide sidewise to open. They are covered with wire cloth on the outside, and have bee-escapes at the top.

The house should be at the lower side of the yard, and so situated that you can get in without having to go up a high step with a load of honey. Following is a plan of the house:



On entering the door, the first is a stand, just the right height for the filled carryall. Beyond and in front of the window is one of Mr. C.'s own make of four-frame non-reversible extractors, which holds 300 lbs. under the reel. From this the honey passes through a large honey-gate to a ten-quart pail; then into a store-can holding from 300 to 500 lbs., and which is just at the right height to run the honey into the two 110-lb. pine kegs, which are stored in the back part of the room as fast as filled.

We do not usually begin to draw off the honey from the extractor until it is pretty well up, so

there is small need of a strainer; but at the last there is a large one made of cheese-cloth stitched to a hoop that will just go over the store-can, through which it is poured, and which is used to keep any stray bees from getting into the honey. The holes are bored in the heads of the kegs with a one-inch bit as they are taken from the car. The plugs are turned, and are a perfect fit every time. The honey that might get past a poor hand-made plug will soon pay for them at one cent each.

The capping-dish is placed within easy reach of the man who runs the extractor, and also of the one who carries in, so that, whichever one has the most time, can use it.

There is a box for the smoker fuel in the corner, and a shelf for dishes of different-sized nails; wires for broken combs; plugs, etc.; also plenty of nails to hang things up on, and a good brass lock for the door. The parts of the lock must be all brass or it will rust out through the winter. One key will fit the lock to all the honey-houses. There is always a pail of water near the door to wash the fingers if they get sticky; and to keep the whisk-broom, used to brush off the bees, soft and pliable.

We have found it cheaper to keep all the things wanted, at each yard, than to pay for the inevitable breakages and loss of moving extractors, etc., from place to place during the season. It does not take any more room to store the things at each yard than it does at home. Such a house can be put up, in this vicinity, for \$30.00.

The places are rented for a term of years. In some cases the houses are to become the property of the land-owner when the bees go away; in others they are built in sections and put on blocks, so as to be moved. When they are to be left they usually agree to pay a small price for them, or the rent is small enough so that we can afford to leave them.

West Groton, N. Y.

[Such articles as these are just what we want. It is the account of real practical work of what has been done—not what might be done in beautiful theory, that makes interesting and valuable subject-matter. Come again, friend Howe.—ED.]

HONEY AS A DIET.

WILL IT EVER BECOME AN ARTICLE OF COMMON FOOD? ARE BEE-KEEPERS SETTING AN EXAMPLE IN THE USE OF HONEY IN THEIR OWN FAMILIES?

It is no doubt very laudable in honey-producers to try to extend the use of honey by getting people accustomed to using it more frequently upon their tables; but we must not be blind to the fact that we have a great deal of prejudice or distaste for honey, real or fancy, to overcome before it becomes a staple article of

diet such as butter, sugar, preserved fruits, and even syrups. Many persons do not like honey; others care but little for it; and I have met several who could not eat it without its making them sick. Housekeepers will naturally cater to the taste of their families and guest, and will not provide an article of food for their table that is not appreciated by the majority, especially if that article is more costly than others that may be substituted for it.

I have traveled some, and visited much in private families. For the last six weeks I have been somewhat of a rambler, and have been the guest of many families in Central Kentucky, known as the rich blue-grass country. I can not now remember of ever seeing honey on the table of a hotel; and in my late rambles I have not met with it on the tables of private families. Speaking to a most excellent matron whose table is very bountifully supplied both with the substantial of life and most of the luxuries that can be bought, she said her family cared very little for honey; and as for herself she would not give one jar of peach marmalade for all the honey in the world, and hence she did not provide it for her table.

Molasses or syrups I have found at the hotels generally, and quite often in private families. The low price of these, and of sugar, and the more general production and use of fruit, all combine to lessen the use of honey.

I do not wish to discourage bee-keepers from trying to make the use of honey more common; in fact, that should be our object; but it is best to look the facts squarely in the face, and I must admit that they seem to be against the use of honey as a common article of food.

What can we do to increase the use of honey? This is a question that I am not prepared to answer satisfactorily, even to myself. We might set an example by using more of it upon our own table. Last winter we had honey regularly three times a day upon our table, and continued to have it more or less all the year round. We would vary it—extracted honey candied; extracted dissolved, and comb honey. But I must be candid, and say it was seldom tasted except by myself and one other member of my family. I am a lover of honey, and do not often let an opportunity pass without eating it. I think that I individually eat not less than 50 lbs. a year. There are so few ways that honey can be used, other than to eat it upon your bread and pancakes, that its use must continue to be limited. In cooking, sugar is better and cheaper. I have tried it upon my porridge, upon my fruit, and in my coffee. My wife, to please me, made cakes sweetened with it; but as great a lover of honey as I am, I must confess that I prefer sugar for these purposes.

What are other bee-keepers doing to increase the use in their own families? How often is honey placed upon the table of our friends at the Home of the Honey-bee, where honey is

plentiful and cheap? and how about its use in other bee-keepers' families?

But, of course, something else must be done. The price of honey is, undeniably, high when compared with other sweets and fruits that come in competition with it. Will the price have to come down? and can we afford to produce it profitably at a lower price? or shall we maintain the price and limit the production to the amount consumed by those who use it only as a luxury? These are questions which I must leave to be answered by those who are extensively in the business.

NOTES AND COMMENTS ON THE A B C.

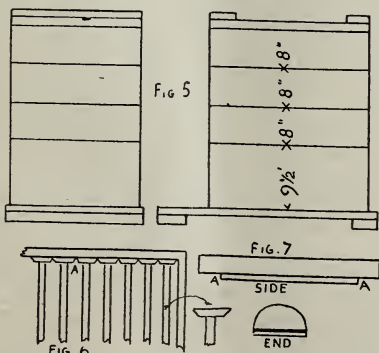
IDEAS OF AN AUSTRALIAN.

By E. James.

I have been much interested in reading your A B C book. I am a practical bee-keeper, and have been working 200 hives in Queensland; but a flood unfortunately swept away years of hard toil in a few hours; but "nil desperandum" is my motto. I love the grand colony of Queensland yet.

I will give you some of my practical experience in bee-keeping in this glorious country of Australia, as no continent in the world possesses such a climate, especially for bees.

1. I was reading in the A B C about smokers. There seems to be a lot of inventive skill thrown away upon them. I prefer the Bingham smoker, with the blast through the fuel; but it is the fuel used that is the question. One day I happened to pick up a piece of bark off a box (a species of eucalyptus-tree), and placed it in the smoker, when I found it gave off an immense volume of smoke: and since then I have used no other fuel.



I have tried a great many kinds of hives, but I have not been satisfied with any of the new-fangled notions. I have come to the conclusion, after considerable practice, that a modified Langstroth-Heddon combination seems to give me more satisfaction than any I have yet used.

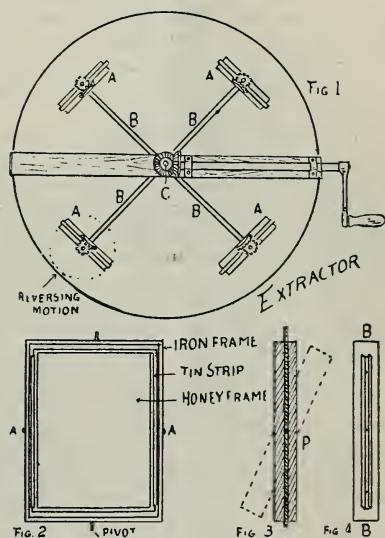
The brood-section is the same size all around

as the Langstroth, but the supers are 8 in. deep. The frames are a modification of the broad-end Quinby, with this exception: the ends of the frames are beveled, or chamfered, as shown at A in Fig. 6. Should the bees build comb up to the end, the frame and case come out quite easily.

Another idea I have is in the line of self-swarming. Place an empty hive in front of the one expected to swarm. I have a thin piece of board with a piece of zinc or tin nailed flat on each end, like a flap. The whole is covered with regulation perforated zinc, as shown in Fig. 7, forming a gangway. Each end at A A is zinc, so it lies close to the entrance of the hive. I have never lost a swarm.

BUZZ-SAWS.

I have recently constructed a saw-bench to work with the foot, and it works to my entire



satisfaction—rips any thing required in an apiary. It is much like the hand buzz-saw shown in the A B C, except that there are no cog-wheels; the saw-arbor turns on centers at each end. There is a small hard-wood pulley on the saw-arbor, three inches in diameter, which is driven by a fly-wheel and strap two inches. The fly-wheel is 27 inches in diameter. On the saw-arbor is a fly-wheel from an old sewing-machine, which gives the necessary momentum. The top of the bench is of cedar, one inch thick, hinged at one end. The other end can be raised or lowered as desired, for grooving, rabbeting, etc. Carpenters have had the loan of the bench, and were delighted with it. I have tried benches made on the principle of the Seneca Falls Mfg. Co.'s benches, but it takes too long to speed up, and I had to discard them—too much friction.

A REVERSING EXTRACTOR.

I have also an extractor—quite a new and novel idea. Each cage turns upon a center, as

shown in Figs. 1 and 2. Inside the iron or steel frame are centers, as at A A. By placing the hand on the top of the cage it is inclined outwardly instantly, and the frame can be taken out or inserted quite easily.

The honey comes out splendidly in my extractor, whichever way I turn.

I is a steel frame; C, cage; P, pivot. In this extractor there is no knack or habit to acquire. In placing the frame in the extractor, put the hand on the top, and draw the top of the cage outward; place the frame in, and the cage falls back into its place by its own gravity. When each cage has been operated upon thus, the extractor is ready. When the one side of the comb has been thoroughly extracted, all one has to do is to reverse the extractor, and the four cages are reversed at one operation. There is little or no jerking, nor any undue strain, as in the Stanley. Four steel arms are required to hold the cages, keyed on the center-shaft. Nothing is required to steady the cages at the lower end. I am not a first-class draftsman, but I hope I have made myself clear.

The cut above shows top view of extractor. A A A are cages for holding frames. B B B are arms, the center being loose on the upright shaft C; but the arms turn around with the cages. On turning the machine the cages are brought into position as per diagram; reverse the extractor, and the cages are completely reversed; although each cage hangs on a pivot at each side, the cages are self-reversing; there is no jerking, as in the Stanley, nor any thing to get out of order. I have a bevel gear to drive it, slightly stronger than your extractor. The frames are so weighty when filled with honey that the teeth of the gear strip or break—at least, that is my experience.

I have known frames to weigh 12 to 13 lbs. with honey.

Australia is a prolific country for bees and bee-food. The various species of eucalypti are wonderful, especially box, gray, and black. More honey is procured on what is known here as the "open box-plains." Here are some figures:

MESSNER'S BEE-FARM.

Williamstown, South Australia, June 18th, 1892; 250 hives produced 47 tons of honey. One colony yielded 45 lbs. of honey per week, or 700 lbs. per season. Not far from where I am, H. Peterson, Wattle Flat, N. S. W., had one hive that yielded 1250 lbs.; 190 hives produced 22 tons, sold for 28 pounds (\$135) per ton, principally from gray box (eucalyptus).

Peak Hill, Australia, Oct. 17.

[Some of your inventions, although ingenious, are quite old in practice. I refer particularly to Fig. 6, the position of the frames, and to the reversing-gear of your extractor. The former idea you will find in looking up Mr. Cowan's book, the "Bee-keeper's Guide," as devised by the author, Mr. Cowan, away back in 1875. But I do not wish to carry the idea that, because these ideas are old, they are therefore

lacking in merit; for, indeed, the Cowan extractor that we are now using, and which has been recently indorsed by the whole bee-keeping world on this side of the Atlantic, was devised some three years earlier yet.—Ed.]

RAMBLE 125.

By Rambler.

IN THE SANTA CRUZ MOUNTAINS.

From the city of Santa Cruz we could see the frowning peaks of the Santa Cruz Mountains. We knew from past experience that they were a toilsome barrier between us and the country we wished to visit beyond. But why should we question the dark canyons and the heights to climb? Had we not surmounted the San Fernando Mountains? yes, and the Santa Yñez? yes, and the Santa Lucia and the Cuesta Pass? yes, and they were all a memory of the past, and we set our faces confidently and resolutely to the surmounting of this barrier also.

As we entered the mountainous region our road led us through a series of romantic drives. We followed the San Lorenzo River, and, after passing an extensive tannery, with its variety of bad odors, we came again into the redwood belt. The smaller trees and undergrowth arched our winding roadway, and the vistas we often caught of waterfalls, forest, and mountains, rustic bridge, and wayside cabins, made the day of travel full of pleasure.

As we slowly toiled up the grade we passed a building fenced with great care. So high was the fence that we could scarcely discern the buildings beyond. A mile or more beyond, again another series of buildings, fenced, gates locked, a forbidding sign, "No admittance." We surmise, "Why all this fencing? too much for poultry-ranches; too elaborate for bee-ranches, for bee-ranches are not fenced in California." Then again we came to fenced buildings; but this time we evidently come to the center of operations, and blazoned to the world in large letters we find the sign, "Powder-works!" So here in a series of buildings, scattered for several miles along the river, explosives of various kinds are manufactured. The buildings are fenced against outside intruders, and located far apart, so that, if an explosion occurs in one building, the next, a mile or more away, will be free from the blowing-up contagion. The powder-works and the tannery below called for much teaming on this mountain road, and loads of wood and bark were constantly met. Five horses to the wagon was the rule—three abreast next the wagon, and two ahead; long-drawn-out teams could not be managed on these sharp curves, so the horses were driven in a bunch, so to speak.

Near Felton our redwoods became so large as to be noted, and visitors are attracted from the highway to visit Gen. Grant and Sherman, and a few lesser lights. As we expected to see

much larger trees we did not bend our course to visit them, but kept on our way. The day was well spent: our ponies were showing signs of fatigue; and while we were considering the advisability of camping, we saw from our forest-canopied road an enticing sign which read, "Lemonaide, 5 cts. a glass." And surely our eyes beheld there among the rocks and trees, and near to a purling stream, an apology for a tent, and a sturdy German stood by the road-side.

The tenor of our conversation, when we halted in front of the sign, was for a good camping-place.

"Dis is der best blace on der road. Durn right in dere," said he, pointing to an obscure opening in the bushes. "Trive town a leedle vays till you gomes to ter prook; camp dhere; von goot blace."

Then Bro. Wilder put in his next invariable inquiry: "Is there good hunting in these mountains?"

"Hunting? Mine cracious! dere's lots off it—teers all ofer dese mountains; dere's von oldt pig fellow gomes town into der roat somedimes, shust at night, somedimes shust in der morning, mit horns so vide;" and he stretched his arms to their full extent. "I ton't see how he gets troo dese woods. No, mine cracious! I ton't. Den dere's mountain-lions. I hears two, sometimes dree, roaring like furies on der mountains. Oh, yes! dis vas a creat game goondry; and dere's vish in der river—creat pig vish, may pe veigh von, do, dree, and may pe seex pount." Just imagine the effect this highly colored news had upon my partner. He was all wrought up for game; and, donning his hunting-equipments, he plunged into the forest. After setting our camp in order I pulled out our fishing-tackle and proceeded in a more quiet way to try the mountain stream. A few trout arose to the bait; but those "von, do, dree, seex" pounders were shy of the hook, and I had to content myself with much smaller fry.

Wilder's deer-hunt resulted only in signs. Signs were plentiful where "dose horns, so vide" had knocked the bark off the trees. The only signs of mountain-lions was the hole they had left in the air, with their roar.

A friendly call upon our German in the evening revealed the fact that he was an ex-saloon-keeper. The authorities in a little town near by had high-licensed and otherwise taxed him so high that he had moved out of town, and he felt as though he was a much-abused man. Many teams passed this obscure retreat of his,

and no doubt he sold much "lemonaide at 5 cts. per glass."

Our trout breakfast disposed of, we proceeded to climb the long and winding grade to the very summit of the mountain. For nearly fifteen miles we climbed steadily upward. Many times our road led around gorges so deep that we could look into the tops of trees whose base was planted 150 or 200 feet below us. The mountain is quite densely wooded until we near the top. It was here, while rounding a spur in the open, that Wilder grasped his rifle again, and, pointing across to the hill beyond, exclaimed in a sort of stage whisper, "A deer! a deer! Just let me have a chance at him."

We both hustled out of the wagon. It was a long shot; and while the sights were being set the field-glass was suggested as the proper in-



"DHERE VAS TEER MIT HORNS SO VIDE!"

strument to bear upon the animal; and what do you think it revealed? I had to laugh rather immoderately when the glass showed a *bona-fide* donkey. It seemed, through the glass, that he had a sort of grimace on his benign countenance. At any rate, it was a sign of deer that Bro. Wilder did not like, and he was worked up to such a pitch that he said not another word for many miles. As indicated by the donkey, we found the very summit of the mountain inhabited. A large number of Swiss people, true to their mountain habits, have here made their

homes, and cultivate land that, to an ordinary mortal, would seem to be hung up too much edgewise. We saw fields of oats and other grains that were certainly upon land lying at an angle of 45°. The only way that crops could be harvested from these steep hillsides was with a half-cart half-sleigh arrangement, and small loads the rule. The land seemed very productive, and, besides grain, grapes and other fruits were largely planted. The scenery from



A DEER, AND WHAT THE GLASS REVEALED.

these heights, as we looked out upon the mountains until they shaded off into the dim distance, was grand and inspiring to the beholder.

Our drive down the other side of the mountain was rapid. Our ponies kicked up a terrible dust, and it was in a dusty condition that we entered the beautiful town of Los Gatos. We were now in the famous and fertile Santa Clara Valley. We found a series of thriving towns, of which San Jose is the crowning center.

Apricot-orchards were without end; in fact, the apricot is to San Jose what the orange is to Riverside and the grape to Fresno.

We camp again at Warm Springs, and this time we were happily located near an old schoolhouse. The good people of the neighborhood, to the number of ten, including the Rambler, assembled that evening in a meeting of prayer and singing. Several young men were in attendance, showing that the heaven of the Christian religion was working in the right direction. One of these young men gave us the information that there were but few bees kept in that vicinity. The largest apiary that he knew of for many miles was further down the valley, and contained 100 colonies. His father, he said, kept a few colonies in his almond-orchard. The almond is profuse in blossoms, and this gentleman found that he had more nuts upon his trees if the bees were there to aid in pollenization. The honey from the almond he pronounced fine. Their bees were kept in a non-scientific way, and the bees were barbar-

ously killed when the owner wanted a taste of honey.

In this portion of the Santa Clara Valley the soil was admirably adapted to the raising of onion-seed, and hundreds of acres were coming to ripened heads. Chinese labor was seen gathering the heads and beating out the seed with the old-time flail. We neglected to hunt up the man with the hundred colonies of bees; but it occurred to us that, near these onion-fields, almond and fruit orchards would be a profitable place to plant an apiary.

For over 250 miles we have traveled now through the coast counties; and not since we left Ventura have we found many bee-keepers. Isolated apiaries we have found in the lower counties; and that there are good localities for profitable bee-keeping in all of the counties, there is no doubt; for wherever we rambled on the barren plain, in the dark canyon, or on the mountain-tops, wherever an opening flower spread its petals to the sun, there we found the busy bee, showing that the little wonder-worker has indeed taken possession of this Western World, and through this fact alone the honey-bee has the profound admiration of the Rambler.

CALIFORNIA NUGGETS.

HOW TO CONSTRUCT A PERCOLATOR: HOW TO KILL A LOT OF KINGBIRDS AT ONE SHOT.

By C. W. Dayton.

In California the antipathy of the fruit-man against bees is equaled by that of him who is trying to dispose of a tract of \$10-per-acre land at \$100 per lot.

The best sign-board and the best advertisement for honey is thirty or forty colonies sitting in the front yard. People dislike to buy honey of those who do not keep bees. It is like milk in a large city—the dairy product is preferred.

A feeder beneath the brood-apartment is preferable in "feeding back" honey to complete sections, as the bees "clean their feet" while traversing the brood-combs. If feeding for winter stores, place the feeder above, as the feed will be taken down faster, it seems to me.

If your apiary is strewn with leaves, as you walk along after dusk toads will be heard rustling the leaves. One way is to gather them up by hand; but a better plan is to sink a few boxes in the earth, level with their upper edges, for the toads to fall into, and deep enough so that they are unable to jump out.

Since it is admitted that kingbirds destroy bees, the next thing is to find a plan to destroy the kingbirds without the expense of a charge of shot and powder, and the time it takes for each bird. Stretch a fence-wire between two trees in line with an upstairs window of the house or barn. In the absence of trees, use high posts. In the absence of such window, let

one post be enough shorter than the other to sight along the wire while standing on the ground. Wait until several birds collect upon the wire, and then clear them off at one shot.

Propolis is suggested as an exterminator of the bee-moth. In using covers to the brood-nests, which are composed of three boards cleated together when new, water ran through into the hives. It also soaked in around the edges, and dropped off near the center of the hives. Since two seasons' use and propolization, they remain dry on the under side through the heaviest and longest rains. If the upper side becomes water-soaked, the under side continues glassy and impervious. It might be added that the covers were of redwood, which is the only kind of wood which does not shrink sideways. The result might be different with pine.

Mr. W. A. Wheeler recommends salicylic acid and powdered borax in water as a cure for bee-paralysis. I wonder if the acid alone would not do as well. If not, then would not the borax alone cure it? If nothing short of the mixture will suffice, it would be interesting to know how the discoverer was able to hit upon the exact specific instead of hitting a million others which might be guessed at. I am thankful for the cure, even if the explanation is not obtainable. I have not lost faith in my own cure (superseding of queens), but I have three cases so early in the season that queens can not be reared. But the acid cure can be applied now. The season of 1893 was a good one for honey, and also a good one for paralysis. Last season was poor for honey, and there were no new cases of paralysis. Now, my wonder is, whether the appearance of paralysis so promptly may not be an indication of an abundant honey-flow in 1895.

To construct a percolator, first get a sixteen-foot board, 14 inches wide, and cut it into four pieces of equal length. Bevel each piece, and nail together so as to form a box 12 inches square at the top and 8 at the bottom, sloping like a mill-hopper. For a bottom to the hopper, get out a small board eight inches square and tack around its outer edge a strip of thick felt to prevent syrup getting through next the outside. This bottom may be dropped inside and allowed to seek its own position. In the center, cut an aperture five inches in diameter, and tack over the same a piece of extractor-screen wire which exceeds the size of the aperture, but should not extend to the margin of the board. Spread over the screen a thin layer of cotton batting, and over the batting another piece of screen to keep the batting in position. Of the waste lumber remaining from the side pieces make four legs by sawing to the right level and nailing to the center of each side. It should be high enough from the floor to set a five-gallon honey-can under. The capacity of the percolator will vary according to the thick-

ness of the cotton batting, the quantity of sugar, and the depth of water. If this percolator is kept full, the yield will be about 20 gallons of thick syrup in 24 hours.

Florence, Cal.

[Your percolator, I feel quite sure, would work, judging from what experience I have had with percolators.—Ed.]

WILLIE ATCHLEY'S EXPERIMENT.

DRONES FROM LAYING WORKERS OR UNFECUN-
DATED QUEENS; ELEMENTS OF UNCER-
TAINTY.

By Dr. C. C. Miller.

It is interesting to learn of the experiment reported by Willie Atchley on page 19. For the honey-raiser the matter may be of no particular interest, for he is not likely to have queens mated at any time when drones of undoubted virility and vigor do not abound; but if it be an error to suppose that drones are equally good, we may as well know it; otherwise there might be trouble come from keeping bad drones to use out of season, for it is easier to keep drones in a colony with a drone-laying queen or with laying workers.

That one experiment, however, should not be considered conclusive. Elements of uncertainty may be present unsuspected. Moreover, there is a little cloudiness, apparently, in the conclusions reached, or that seem to be reached; for although the experiment did not involve drones from unfecundated queens, yet Willie says, "I am now fully convinced that I do not want any of my queens mated with any but drones from best fertilized queens." Suppose that it be fully established that drones from laying workers are utterly worthless, does it necessarily follow that drones from an unfecundated queen are any thing but the best?

We should be the more slow at reaching conclusions, because, if I mistake not, the book authorities, where they are not entirely silent on the subject, agree in giving drones credit for value from whatever source they may come. Berlepsch, a man who stands high as an authority, says: "The eggs laid by fertile workers produce perfect drones. I firmly believe this, because the drones thus produced precisely resemble, in every respect, those bred in colonies having fully fertile queens." See *American Bee Journal*, 1861, page 146. Dzierzon, page 24, *Rational Bee-keeping*, says, "As in every respect they are like drones originating from a queen, there is no reason why they should not also possess all the capabilities of the latter."

Cheshire says, "The powers of the drone just described are, almost with certainty, not alone true for those brought up in the normal cells of their sex, the issue of a fertilized mother, but for all indifferently. Hereafter we shall more fully explain that the egg yielding the drone is

unfertilized, so that those born of mothers that have never mated (drone-breeders) are as perfectly developed and as fully virile as others. Dwarf drones also, raised accidentally in worker-cells, or those from the eggs of so-called fertile workers, or workers which, although incapable of impregnation, have yet commenced ovipositing, seem not one whit behind the rest."

It will be noticed, however, that, however high these authorities, their views are not based upon actual experiment, so that, although we should be careful about reaching any opposite conclusion, it is certainly reasonable for us to say that the case is not entirely closed. I would give more for the results of a sufficient number of experiments in the hands of careful observers than for the theoretical views of all the scientists.

Willie says, "I am perfectly satisfied that the queen has the power to deposit eggs without having them come in contact with the semen, or fluid deposited by the drone, and *all* such produce drones. I should be glad indeed to have some of the old heads take this thing in hand, say Doolittle or Prof. Cook, and see if I am not right." Of course, you're right, Willie; but, bless your heart, there's no need for any one to take it in hand. That question was fully settled before you were born. Look at the first volume of the *American Bee Journal*, 1861, and you will see the matter fully discussed and settled in the series of papers on the Dzierzon theory.

At present there is a large amount of theory and a small amount of practice to settle the value of abnormal drones. That being the case, it can hardly be presumptuous to theorize a little more right here.

A worker is not a fully developed female; and although there may be more development in a laying worker than in an ordinary worker, still there is not a full development of the organs of reproduction, and on that account one would hardly expect as good progeny as from a female fully developed in all the parts that in any way have to do with providing and furnishing a vigorous offspring. The worker was never intended for a mother in the first place, and one would hardly expect her to be an unqualified success in that direction. The experiment of Willie Atchley, while in itself not conclusive, is valuable in that it goes just so far toward establishing as a fact, that the offspring of laying workers do not equal those of fully developed queens.

With regard to drones from unfecundated queens, Willie has a rather cavalier fashion of settling the question by manufacturing a definition to fit the case. An undeveloped drone, says he, is a drone from any but a fertilized queen. As we want a fully developed animal for a sire, that at once settles the case, and there is no need of any further experiment. But is it fully established that a drone from an

unimpregnated mother is not as fully developed as one from an impregnated mother? The argument seems to be that the drone is undeveloped because the mother is undeveloped, "as we all know that a queen is not thoroughly developed till she is mated and begins to lay." Do we all know that? Is the fecundation of a female a part of its development? Take two flocks of hens, the one flock fully developed in every respect, and having a cock in the coop; the other precisely the same, except that the cock has been carefully excluded, would you say there was any lack of development in the latter case? Is there no case of full development among the thousands of mares that are never used for breeding-purposes!

Here's a choice tested queen fully developed. How much did her fecundation contribute to her development? Suppose her wings had been clipped during her virginity. Would her development have stopped? Would she not have grown to the same size as now? Would she not have been the same in every respect as now, with the single exception of an empty spermatheca? And in the case of the tested queen, does that spermatheca have any thing whatever to do with the eggs laid in drone-cells?

I don't know the answer to all these questions, and I should want somewhat positive answers before settling down to the belief that a queen can not be mother to a fully developed drone just as well without as with fecundation.

A point still to be noticed is, that a drone-laying queen, even if it should be fully proven that she can raise the best of drones, in actual practice does not raise, or, rather, from her eggs there are not raised, drones of normal size, simply because they are mostly raised in worker-cells; and I think no one would be so well satisfied with drones below the normal size.

On the whole I commend the decision reached, which is seconded by the A B C, to raise drones from only the best fecundated queens.

Marengo, Ill.

LARGE AND SMALL HIVES.

A GOLDEN MEAN; HOFFMAN FRAMES, ETC.

By H. L. Jeffrey.

Mr. Editor:—On page 952, 1894, I note your editorial, "Large and Small Hives, Again." There, as in other places, you refer to the ten, twelve, and sixteen frame hives. Now, just let me tell you that you are not fresh or new in that line of the number of frames; but before going into the experience points I will refer you back to GLEANINGS of twelve or thirteen years ago—1881 or 1882, perhaps 1883—as a proof of what I am going to say, and I will quote from memory, and let you look up the proof of the date; and yet in practice I can go back fifteen or sixteen years. Twelve or thirteen years ago I wrote to A. I. Root from Washington, Ct., that

I was using what I called the Simplicity chaff hive—a hive $18\frac{1}{2}$ inches square inside, with three or four inches of packing at each end of the frames. The hive stood on a chaff-packed bottom-board, and at the *sides* I used a cushion or chaff-packed frame, cloth on one side and thin boards on the other side, turning the cloth toward the bees in winter, contracting the brood-nest to four, five, or six combs, as it was necessary; and in the spring, as early as convenient, I cleaned out the hive, and turned the *board* side of these side cushions toward the bees. When I nailed on these board sides, in the first place I laid two or more thicknesses of cloth on the ends and bottom of this side frame, and let the cloth project from $\frac{3}{8}$ to $\frac{1}{2}$ inch beyond the frame. The cloth is used as a heat retainer or confiner, to prevent the heat from escaping around the end of the frame.

Well, these thirteen-frame hives very often had eleven frames of solid brood, except the top corners of the frames that were filled for three or four inches with pollen and honey; and, what is more, they not often swarmed. I used two styles of surplus-cases on them. One was the wide frame for 8 sections; the other, a case for 4 sections in a row, to place the sections cross-wise of the frames, and use separators, ten sections from front to rear, making 40 sections to the one-tier case, and using two cases high. The sides of these hives were 28 inches long, because they were made of $\frac{3}{4}$ lumber.

Now for the reasons of the chaff *ends* to the hives; I had always noticed that, in winter, in the single-walled hives, hoar frost or needles of ice formed between the ends of the frames; and by this packing I got rid of that frost in the hives. Then in the case of the $18\frac{1}{2}$ inches in the width of the hive, I had a place to use a side frame of 8 sections at each side, and a half-inch division-board with eight or nine brood-frames before the bees were so numerous as to necessitate putting on a top case.

Besides these large hives I used others, varying from seven frames up to thirteen. At that time, and for thirteen or more years, I was taking care of bees for other people, either wholly myself or by supervision, besides taking care of my own bees, and for years I had the charge of from 100 to 300 hives of bees, located in six or eight towns, in apiaries varying from six or seven hives up to sixty.

A good many objected to these large hives because of their expense, as they had, besides this chaff-packed end and chaff-packed bottom, an outside shell 12 to 15 inches deep, that, for winter, was let down to the bottom, and in summer it was raised so the lower edge was 2 inches below the top of the hive-body, and a cleated and rimmed-top cover. Because of the objection of expense, and the inconvenience of handling and moving these large hives, I made and used for other persons hives holding ten and eight frames; and I can, from experience and close

comparison during years of practical use, say that the large hives were, in dollars and cents, and profitable results, every way the least expensive. But if you will take a pencil, and figure up every thing, the figuring will prove that these large hives cost the most every time, and that is where figures do actually and practically lie. But with the practice of fewer hives, and the time of changing place to work from one hive to another, the time of hiving swarms, and I could name a dozen other items, to say nothing of the larger number of finished sections from each hive, that alone is item enough to make the preference for the large hive. But when you go above that limit of the square, $18\frac{1}{2}$ inches by $9\frac{1}{2}$, then you can just stop—just step down and out. *That* I have tried, and had to own up beat.

THE HOFFMAN FRAME—WHY I LIKE IT AND WHY I DON'T LIKE IT.

It is not the spacing and fixedness of it that are its best features, but I will admit that the spaced stationary feature of the Hoffman frame is reason enough to make it universally adopted. On account of the forming of ice at the ends of the frames being the reason for using packing at the ends of the hives, I adopted the Hoffman frame in 1879. A pattern of this I obtained from J. H. Nellis, with the wide part of the end-bar made wide for 5 inches, which gave me very gratifying results; but these results the first season only raised the question of how I was to get rid of a cursed nuisance that I had heard more cursing and swearing about than would be necessary to send all the employes of A. I. Root to satanic regions; that is, the plastering of comb and honey at the ends of the combs in the hive. How many hundreds of times I have seen the plastering done when there happened to be one of those sudden heavy flows of honey! and that very disgusting thing happened in 1893 and 1894 with the Hoffman frames that you have sent out with those short wide ends. Only this past season I was called twice to tell parties what to do to stop the trouble of having the honey there at the ends of the frames, and both parties said they wished the ones who made the frames and hives were—not in heaven—"further than they were out of it."

Now, then, friend Root, make that wide part just $\frac{1}{4}$ of the length of the end of the frame; make the ends fully $\frac{3}{8}$ thick, and stop that sharpening of the edge. You go and see how many will be shoved by each other, and hear the swearing that I have heard, and you will make no more sharp edges to cause cursing.

I began using the Hoffman frame in 1878. In 1879 and 1880 I used a few with the end-bars $1\frac{3}{4}$ wide the whole length, and I began to practice reversing them; and after 14 years' use, in all sorts of places, I am forced to say, give me the full-length $1\frac{3}{4}$ -wide end-bar, just $\frac{3}{8}$ thick; and having used 3000 pair of your reversing-wires, I do not want wood rests, for two reasons: 1.

They are more easily pried up; and the chief and second reason is, turning combs over does pay, especially when it is the cause of making the bees finish a crate of sections, to say nothing of being a convenient way to make a swarm stay at home when it is put back the next day after swarming; and those solid combs are, beyond dispute, a very great hindrance to swarming, because, without that lower space between the bottom of the comb and bottom-bar, there is no great inducement to build those cups that are such a coaxing inducement to the queen to lay in them, and send things swarming fever fashion.

A LIMIT TO THE NUMBER OF FRAMES THAT MAY BE USED IN THE HIVE.

I feel sure—yes, I can say that I *know*—there is a limit to the practical use of the number of frames used side by side. You have said, "While ten frames may give slightly better results, a twelve or sixteen frame brood-nest would give still better results." Just stop, before you, by such insinuations, "make thy brother to err." It takes years to prove such a statement to be practically true. I will admit the twelve; but fourteen I shall watch and wait, doubt and disbelieve, discourage and denounce; and the sixteen I shall discard and condemn.

Right here I will say that there are many who will say to you, "Bring on your queens to fill and keep full of brood those twelve-frame hives." Such queens have lived; such queens now do live, and such queens there will be. I have had them live to be four years old, and not so very few of them live five years in those thirteen-frame hives, and have kept their workers humming each year, so that it made me as well as other persons wonder whether those large hives did not make the queens better than the small hives; or, in other words, did not those small hives restrict a queen to such an extent that she was in some way injured by a lack of room? How does that strike you? There surely has been some evidence in favor of unlimited space being beneficial; and it is true beyond denial, in all nature, that restricting natural functions is detrimental to both life and health. Larger hives, solid combs, and queens reared out of the swarming season, are the non-swarming climax.

You may tell Mr. E. F. Quigley, p. 951, 1894, that those very late queens are the least likely to swarm — are the steadiest layers, live the longest of any queens, and are the strongest of any, because they are not exhausted while young, in early production. The proof of the pudding is in the eating of it. For years I have raised very late queens entirely, for my own use, and I have written several times about their superiority, although I have never seen the articles in print.

Woodbury, Ct.

[I do not know where you get your foundation

for thinking that I claimed for myself priority on the question of the desirability of large hives. I am, and have been, well aware that it has been brought up a number of times through our back volumes. But in former times it was dropped before any thing definite could be arrived at. My purpose has been to focus down the experience of our best bee-men into something more tangible along these lines, and a little light is beginning to break already, I am thinking.

You fail to give the *whole* of the sentence regarding ten and sixteen framers you quote, and thus give a wrong impression. I said, if you will refer again to page 952, that "I am coming more and more to believe that" such would be the case. I haven't come to that belief yet. The sentence as a whole was suggestive rather than positive, and for the purpose of calling out reports from others; and among those already received, yours is one.

As to that "cussed nuisance," there may have been some occasion for it in the case of the old Simplicity hive when the space was $\frac{3}{8}$ of an inch between the end-bars and the end of the hive. But in the Doveetailed hives, with the space only $\frac{1}{4}$ inch, we have never heard of there being any trouble. Your experience seems to be at variance with that of the whole bee-keeping fraternity. When almost everybody was using the regular Langstroth frame with its narrow end-bar—narrow clear up—we scarcely heard of burr-combs being deposited back of them, except where the bee-space was more than $\frac{1}{4}$ of an inch.

As to the wide part of the Hoffman end-bars, the length that we use is in proportion to the depth of frame used by Hoffman. I have tried them (the wide part) deeper, but I did not like them so.

Mr. J. has suggested some practical thoughts, although I think he is inclined to put some things overstrong.—Ed.]

TWO EIGHT-FRAME HIVES NOT MAKING A SUITABLE BROOD-NEST, AND WHY.

I was much interested in Mr. Chrysler's letter, on page 948. It chimed in with my experience exactly, so far as my experience goes. I ran a dozen colonies last season in two-story eight-frame hives; it worked pretty well until the honey-flow came, and then in some of them there was a marked inequality between the upper and lower stories, and two of them finally confined themselves to a single story—one using the upper story for brood, and one the lower.

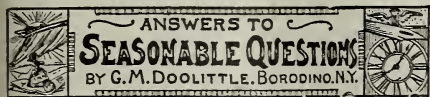
By this time, thanks to your impartial leadership, a little light is being shed on the subject—it is not altogether the mystery it formerly was. But there is one thing not yet satisfactorily presented. Most bee-keepers raise comb-honey, and how in the world is the two-story eight-frame to be recommended to them? There is too much lifting and manipulation connected with it. If the majority of bee-keepers ever get to using brood-chambers of large capacity, I am inclined to think they will "flop" just as Mr. Chrysler did, and as I propose to do. But, let's hear all sides. I would suggest, as the next thing in order, that you get an exhaustive article from E. France, theoretical and practical, on the subject, "Why the two-story eight-frame is to be preferred to all

others for *comb honey*." Then get somebody of experience on the other side (like Dadant) to answer Mr. France's point in detail. We are not through with the hive discussion yet.

Put the case of a man who winters his bees on the summer stands: How much lifting will he have to do, ordinarily? The argument of weight has been made too much of. It is not a general, but a special consideration.

Arvada, Col., Dec. 24. F. L. THOMPSON.

[Mr. France has already set forth his views on this question—see page 45, Jan. 15th issue. Yes, we should be glad to have the Dadants review this whole question from their standpoint, if they will. For many years they championed large hives alone. Now that there are more on their side, perhaps they can set forth their views with more assurance.—Ed.]



GUARDING AGAINST STARVATION.

Question.—What is the best way to guard against bees starving before feeding can be done in the spring? I have fears that my bees have not honey enough to carry them through till warm weather comes.

Answer.—As our questioner asks for "the best way to guard against bees starving," I am inclined to answer that the *best* way is to *know* that each colony has sufficient honey or stores in the fall to last it till the flowers bloom in the spring; and if we know this we need have no fears as to their safety along this line. But some one will ask, "How much stores should each colony have that I may know that there is no danger of starvation?" That is right; ask all such questions you like, for in former years it was just such little things as these which bothered me, and, strange to say, these little things, as most bee-keepers call them, were the hardest questions to find answered in our bee-papers. I hunted through volumes before I could find the amount, given by any writer, that it would take to winter a colony of bees safely from October till May, doing this hunting in the columns of the bee-papers published prior to 1875. The amount which I found first, gave 35 lbs. of actual stores as being the right amount of food necessary to carry a colony through. This almost staggered me, as I had found by weighing the combs of honey in each hive, that not one of my colonies contained that amount, while very few contained 30 lbs. So I kept on looking, when, after a while, I found another writer giving 25 lbs. as sufficient to winter a colony which was to stay all winter on its summer stand, and 20 lbs. for those colonies which were to be wintered in the cellar, during the four months of the coldest weather. "Here," said I, "is some-

thing worth more to me, just at this time, than all I have paid out for bee-papers up to the present;" for had I been obliged to make the stores in all my colonies up to 35 lbs., the sugar would have cost me much more than all I had paid out for bee-books and paper so far.

To digress a little, I wish to say that hardly a year passes, even after I have been constantly reading up bee-literature for the past 25 years, but that I find something during the year that is of more value to me than all the bee-papers have cost me for that 25 years, and yet not a fourth of the bee-keepers in the United States take any bee-paper. I never could understand this penny-wise-and-pound-foolish plan that so many adopt when you urge them to take one or more bee-papers. But to return:

By exchanging combs with my colonies I was enabled to give each colony wintered outdoors, 25 lbs., and 20 lbs. to those wintered in the cellar, and found all came out well; so I set these figures down as the right amount of stores for safe wintering from flowers in the fall to flowers giving honey in the spring; and to-day, about 17 years having passed since I read that statement, I would advise the above amounts as being correct for the beginner to put as the standard. But it will be noted that our correspondent does not say from flowers to flowers, but till "feeding can be done in the spring." Well, how much is needed in this case? This is something different, and something not often spoken about, yet it is something we should like to know about; for I claim that, if there is any time when it is profitable to feed colonies to keep them from starving, it is in the spring of the year. Why? Because if we let them die now we lose all they have consumed thus far; and, besides, feeding in the spring gets the colony in the very best possible shape to give a big yield of honey during the honey harvest; and as this latter is conceded by all, it is often to our advantage to reserve the feeding necessary to be done to give sufficient stores during April and May, till April and May arrive, providing we can know that no colony will starve before that time. One fall I found my colonies quite light; and as I was short of money to buy sugar with, I allowed only 18 lbs. to each colony designed to be wintered on its summer stand, and from 12 to 14 for those to be placed in the cellar, and found, by equalizing the stores in all, that I did not have to feed that fall. From a trial of this amount for ten different winters, and not having a single colony starve or require feeding before April first, I lately let all colonies go into winter quarters that have 12 and 18 lbs. respectively, and feed all that are short in the spring where necessary, but so far have had to feed but very few at all.

But we will suppose that our colonies have been neglected in the fall from a lack of knowledge of just how many pounds each colony

should have, or from sickness or a pressure of business, how are we to guard against the bees starving? As I object to feeding bees during the winter months unless absolutely obliged to to keep them from starving, I adopt this plan along the line of "guarding."

On some mild day when it thaws a little, without the sun shining (can see best on a cloudy day), go over all the colonies outdoors by removing what you have over the quilt or cloth covering to the frames, and then gently roll this covering up till you come to the cluster of bees, when you will carefully note the amount of sealed honey you can see not covered with bees. We will say it is about the first of February when you do this. If you find plenty of sealed honey along the top-bars of the frames, you can set that colony down as having enough till April. If plenty in half the combs, then it is good till March. If very little, then it should be looked after in two weeks; and if none at all, it should be fed at once. All not needing feeding at once should be left with the hopes that a day warm enough for the bees to fly may occur, when all needing attention should be attended to; but should no such day occur, then they should be attended to before they starve, no matter what the weather.

Well, how shall we feed at this time of year? My way has been to take frames of honey from those in which I see much sealed honey, and give to those about to starve, taking out the outside combs of honey on any day when I could best do so, and putting division-boards in their places. I now place these combs of honey in a warm room for four or five hours till they get thoroughly warmed through, when I go to the destitute colony, take out one or two empty combs on the outside, divide the frames near the center of the cluster of bees, using smoke to keep them from flying, and set in the warmed combs. In this way any apiary which was not in nearly a starving condition in the fall can be brought through till we can feed in the spring. If the colonies are in the cellar, and are where the combs can be got at, they can be looked after in the same way. In the spring the feeding is done with feeders in the regulation manner, but feeding with any thing but combs of sealed honey during the winter months is very unsatisfactory, as a rule.



AN INVESTMENT THAT PAID.

Early last spring it was my good fortune to receive an offer from a party living about ten miles from here, to sell me her entire outfit of bees, hives, tools, etc., for \$40. I went to see the "outfit," and found fifteen colonies of bees,

pretty fair Italians, an extractor, two honey-knives, Bingham smoker, several hundred sections, and about 250 brood-combs, together with nearly 100 old hives that were fit for nothing but kindling-wood. The trip resulted in my accepting the offer, providing they would deliver the whole lot at my place, which they did. During the season they threw off several new swarms, only two of which I secured, the rest going off, owing to my absence from home. They stored 500 lbs. of honey, which I sold at an average price of fifteen cents per pound. From the old hives, musty and broken combs, I secured 75 pounds of wax, which I sold at 24 cts. per pound. I transferred them from the old Quinby frames to the new Hoffman, and in the two-story chaff hives. In preparing them for winter I doubled them up and now have 12 colonies in fine condition; enough kindling-wood for the winter; 100 brood-combs, Quinby size; 500 pounds of honey at 14 cts. per pound, \$70; 75 pounds of wax at 24 cts., \$18; total, \$88.

First investment, \$40; new hives, \$18. Balance on hand, notwithstanding the "bad season and locality," the pleasure and experience, \$29.90. VAN E. FREEMAN.

Joilet, Ill., Jan. 5.

THE READING OF FOREIGN BEE-PAPERS AT THE CONVENTION; WHAT THE EDITOR OF THE "BIENENZEITUNG" THINKS ABOUT IT.

In regard to the reading of the foreign papers at your St. Joseph convention, I am of the opinion that Mr. Hutchinson, in his *Review*, is somewhat astray in his position. Mr. Abbott, I think, sees the matter from the right standpoint. I would not have written my article, to be published only in your bee-papers, without payment. Reading my paper in a more condensed manner would have made it worthless. I wrote it as an honorary member of your association, honoring your association and not myself the least. What my friend Frank Benton has said in regard to the invention of the movable-comb hive by Dzierzon, I appreciate. But I have not expressed myself in the right way. I should have said: "Dzierzon invented (as Langstroth in America) the only first *practicable* movable-comb hive—a hive that could be used better than any other invention before, and therefore they were starting a new era."

I have read GLEANINGS with much pleasure, and not the least the Notes of Travel by your father. C. J. GRAVENHORST.

Wilsnack, Germany, Jan. 2, 1895.

HONEY CANDYING BEFORE COLD WEATHER, AND WHY.

I wonder if you have had an experience like mine. This year, when I extracted in September, combs that were built and filled in August contained many cells of candied honey, just as taken from the hive; and all extracted thickened soon after, before any cold weather came.

What is the probable cause? No syrup was fed till after that time. C. H. LUTSON.

Bridgewater, Mass., Dec. 20.

[Honey from ordinary sources does not candy before cold weather; but certain kinds will granulate very shortly after being put in the combs. The fact that the honey was gathered in August (after the usual flow from basswood and clover) shows that it must have been from some unusual source.—Ed.]

WERE QUEEN-EXCLUDERS USED IN THOSE TWO AND THREE STORY HIVES?

I read in GLEANINGS for Nov. 15, 1894, where they tell of those big honey-yields in two and three story hives. The question in my mind is, did they let the queen have the run of the whole hive, or did they use a queen-excluder? Please tell me, is it best to use a queen-excluder for extracted honey? FRED CARD.

Burns, Mich., Dec. 15.

[I can hardly answer in the case of the honey-yields in question; but I should *suppose* that, in most localities, the excluders would be put on top of the second story. In localities less favored it would doubtless have to be put on the first story. The strength of the honey-flow would have to decide the matter largely.—Ed.]

THE CROSSES OF FIVE-BANDED BEES.

I see on page 23, GLEANINGS for Jan. 1st, that the editor has something to say in regard to the crossing of five-banded bees with blacks. My experience and his are not alike, as I have never yet seen a five-banded queen mated with a black drone make all yellow bees. On the contrary, they *always* make some black bees, the same as any other hybrid queen or mismated queen. Now, a five-banded queen can mate to a three-banded drone or to a hybrid, or to any drone whose mother has any yellow about her, and, likely, she will not make any black bees. My experience along this line is, that any yellow queen, it matters not what stock she is, will make some black bees, or nearly so, if she is mated with a pure black drone. I was of the same opinion as Ernest till I thoroughly tested this matter, and now I feel convinced that, when the bees of a five-banded queen show no black bees, she has mated to a drone that had some yellow blood too.

I have asked the opinions of two or three of our most extensive breeders of five-banded queens, and they take sides with me. I think that, when a five-banded queen mates with an impure drone, her bees as a rule will be cross, as most other hybrids are. Not, will the queens make some black bees? but they will make some of the blackest black bees I ever saw. We had one yard out last year, and thought we were putting them out away from other bees, and we soon found that there were black bees near them, and moved them away out on the prairie, and some of our queens were mated before we found out that blacks were close; and I tell you we had some of the blackest black

bees we ever saw, and the queens were from our best five-banded mothers, and they made bees from pure blacks, as far as color goes, up to five-banded, and the bees were as cross as hornets.

I fail to see where the five-banded bees, crossed with any other race of bees, makes them more cross than other hybrid bees. This I mention as I thought of it.

Now, Ernest, you and I will have to fight it out, and I am going to hold my ground as long as I can honestly; and when I see you are getting the best of it I will give it up; but I must say that I think you are away off on this statement, and do not see where you are going to get out unless you walk backward. As for breeding bees for color alone, I think one should be ashamed to do such a thing, and sell the queens, as such a breeder would soon play out, and at the same time injure his fellow-man. I have come to the belief that queen-breeders should be the most careful of apiarists, as they have the reins of the honey-producer, and may lead him to ruin by breeding from any and all kinds of queens. I tell you, it is a serious thing, as well as a matter of dishonesty, for a queen-breeder to use any thing but the best of queens for mothers. I know that I have got off the track, but I just thought of these things, and made mention of it. I should like to hear from others on this subject.

Beeville, Tex., Jan. 17. JENNIE ATCHLEY.

Friend E. R. Root:—I notice in January 1st GLEANINGS, page 23, an editorial stating that a cross between a queen of five-banded stock and a black drone or a five-banded drone and a black queen will, according to your experience, result in all the bees showing at least three bands, etc. I am quite surprised to hear you say this, as my experience does not coincide with yours. Last season I gave the cross-mating of several different strains of bees a thorough trial; and I find, so far as my experience goes, that a cross like the one you refer to will result in producing bees that show from one to three yellow bands, and quite often there will be bees that are produced in this same colony that are as black as the blackest bees I ever saw. Please bear in mind that I am speaking of a cross between five-banded stock and *pure* (German) black drones. I should be pleased to hear from some other queen-breeder in this line, through GLEANINGS. F. A. LOCKHART.

Beeville, Tex., Jan. 17.

Dear Mr. Editor:—Did your hand tremble a little bit when you wrote that editorial on mismated five-banded queens in last GLEANINGS? I have had numbers of them mated with black drones in the past four years, and not in one instance have I found one producing all straight three-banded bees. Who told you about that? Chrisman, Tex. C. B. BANKSTON.

[See editorials.—Ed.]



DON'T fail to read A. I. R.'s hints on shipping comb honey during cold weather, in this issue—see page 107.

Two bee-journals now hail from one State. The *Nebraska Bee-keeper*, in its sixth year, and the *Nebraska Queen*, in its second year.

THE article by the Porters, on bee-escapes, will be read with interest, although it seems to have been written for the editor's private ear.

I HAVE just found out who "M. Dea" is, in the *American Bee Journal*, but I shall not tell who he is. In our next issue we shall have a communication from him in our own columns.

AN excellent portrait of Dr. Miller appears in the last *American Bee Journal*. It shows him as he now looks—not so strong and rugged physically as in former years when he sat for his picture, but not one whit older in spirit.

THE paint-mill referred to in a former editorial is now here. We are experimenting with it, grinding up coarse sugar and honey, but so far I am unable to tell whether the results will be favorable or not. Reports will be given later.

I WONDER how many have a comfortable feeling during these cold days (as we find them up here in the North), in the thought that their bees are put in winter quarters in a condition as nice as they knew how to put them. If the winter continues as it has been for the last month or so, it will be a severe one on bees not properly provided for.

I HAVE learned with much regret that Mr. C. E. Parks, Secretary of the G. B. Lewis Co., of Watertown, Wis., and senior member of that firm, is dangerously sick in Florida. Mr. Parks is a man who is well known, not only to the trade, but to the general bee-keeping world, and I am sure I voice the feeling of all in hoping for his speedy recovery.

WITHOUT a single exception, I believe, all the queen-breeders have held up their hands, signifying their purpose to destroy the first case of bee-paralysis as soon as it shall be discovered in their yards. This policy, I feel sure, if adhered to, will stamp the disease out of existence; but if we get the idea in our heads that such extreme measures are not necessary, no such favorable issue may be expected.

I LEARN by the *American Bee Journal* that there is a possibility of Hon. Eugene Secor becoming Governor of the State of Iowa. Good!

I know nothing about his politics; but I would vote for him (if I could) though he were nominated by the Democrats, Republicans, Prohibitionists, or Populists. He is a thoroughly good man in more ways than one. It is this kind of men we want in public office, irrespective of party lines.

I FIND we are again obliged to leave over a number of good articles. Possibly some of them may never see the light of day through the pages of GLEANINGS; but I shall endeavor to give the best of them, and trim down others to the point of solid meat. I might mention here, that one of the most interesting articles we have ever published on bee-paralysis will appear in our next issue, from the pen of that careful and laborious worker, Ph. J. Baldensperger, of Nice, France.

THE story is going the rounds (see the *American Bee Journal*) that Dr. C. C. Miller read an essay at the Illinois Bar-keepers' convention. It would be a "rough one" on the doctor (and probably a good deal rougher on the convention if the doctor had it to do) did we not know how easy it is for a printer to mistake "Bar-keepers" instead of "Bee-keepers," from ordinary handwriting. Or perhaps the mistake was in the telegram, for the printer would hardly make the mistake twice in the same item. Yes, such conventions need a little of Dr. Miller's salt. I hope the doctor's past record will enable him to live down such a report.

THE following sad news is just received from our brother-editor of the *American Bee Journal*, and will explain itself:

A beautiful baby girl came to the home of the editor of the *American Bee Journal* last Friday evening—Jan. 18; but it stayed only a few hours. Of course, there are sorrowing hearts, for its mother and I had hoped so much that when the baby came it might stay with us, and be a great joy and blessing to our home. But, although 'twas hard to give up, we bow submissively to the will of Him "who giveth, and who taketh away."

Mrs. York is doing fully as well as could be expected under the circumstances, I am thankful to be able to say.

BRO. York has our sincere sympathy. These little people, as I know by experience, bring a world of sunshine to the home. I do not know what it is to have that sunshine taken away, for the kind Father has spared me that pang.

IN the department of Kind Words will be found a few reports of the successful mailing of queens to Australia and New Zealand. We have other reports that we do not publish, where the queens went through dead; but as nearly half of the queens went through alive, we feel greatly encouraged, and are in hopes that we shall be able to master the problem after all. The whole secret rests in getting the

candy just right. The candy we last used was made of coarse granulated sugar and honey, with a very little of the pulverized to stiffen the dough. Among those where the queen went through dead, the cause was evidently starvation. The honey had all been taken out between the granules of sugar, and the dry particles of the latter were no better than so much sand.

THOSE CROSSES OF FIVE-BANDERS.

IN another column will be found a reply by Mrs. Jennie Atchley and F. A. Lockhart, to the editorial on page 23, to the effect that a cross between a black drone and a five-banded Italian queen does not necessarily show one and two banded bees, but that such bees show all the characteristics of ordinary hybrids, with the exception of color. Mrs. Atchley's experience and that of Mr. Lockhart seem to be diametrically opposite to ours. As she says, let us hear from others on this point. It is only by getting testimony from quite a number that we can form a really decided opinion on this question.

As to my own statements on page 23, I have just been out to ask our apiarist if I had made any mistake. He says not. He is very positive that some of our five-banders, while showing good color, were crossed with hybrids, because their progeny is so fearfully cross. We obtained five-banders from a number of breeders; but as not all of them are cross, I can not say that Mrs. Atchley's bees that we received showed any bad traits. Indeed, so far as I have been able to trace them they were gentle and beautiful, and in several instances were energetic and good workers. As Mrs. Atchley breeds from original Doolittle stock, and, I have reason to believe, takes more than ordinary pains, I assume that her stock is both beautiful and energetic. Mr. Lockhart, I believe, has the same stock.

WIRING BY MEANS OF ELECTRICITY.

WE have not said much of late about imbedding wires into foundation by means of electricity. It is not because we considered the plan impracticable, nor because we have found another and better way — nay, far from it. We could scarcely drive our people to imbedding wires with the old-fashioned spur-wheel, so slow and unsatisfactory is it, compared with the neat and rapid method by means of electricity. But perhaps some of you may have forgotten how to construct the battery. Secure three crocks, of not less than a gallon capacity each—larger will make the batteries run longer; and where much imbedding is to be done, crocks of not less than five gallons capacity should be used. For about a cent apiece you can get electric-light carbons at the nearest electric-light station—just such carbons as are used for arc lights. You will need, for

each cell of your battery—that is, for each crock, three long carbons or six short ones. Now, for each crock secure a square board of inch stuff, to cover it. Describe a circle on one of the boards, the circumference of which should be about two inches smaller than the inside diameter of the crock. On the line of this circle bore six holes equally distant, just large enough to receive the carbons. Wire these carbons all together by running a naked copper wire around each carbon a couple of times and then pass it on to its neighbor. Proceed thus with each board. In the center of each circle bore a hole large enough to receive a rod of zinc, the size and length of which is immaterial. If you can not get rods, take sheet zinc and roll it up to about an inch in diameter, and as long as the carbons. Solder a wire to each zinc. The wiring to each cell or crock should be so arranged that the zinc of one battery will be attached by its wire connection to the carbons of the other battery, and so on until you have one free end of the wire from the carbons of one cell, and one free end from the zinc of another crock—the other cell being connected with the other two. These two free ends are to be attached with spring clips, in such a way that they (the clips) engage, or come in contact with the two ends of the wire running through the frame to be filled with foundation. Now, then, before you proceed to work you will need to throw into each crock, say for the three-gallon size, a couple of pounds of bichromate-of-potash crystals. Fill the crock to within $1\frac{1}{4}$ inches of the top, with hot water. Allow it to stand three or four hours, and then pour about a gill of sulphuric acid into each crock; stir; insert the zinc and carbon element, and you are ready for business.

We have experimented with almost every form of galvanic battery that we could learn or read of; but none gave anywhere near such satisfactory results, for the money, as the one just described. If you do not reckon your time at night and mornings, the whole outfit ought not to cost you more than 75 cts., including the chemicals and all.

One charge for the five-gallon size ought to imbed about 1000 frames; but after you have put in about 200 frames you will need to let the battery "rest," i.e., recuperate itself, which it will do in about three or four hours; then you can imbed a couple of hundred more. The activity of the battery may be greatly assisted by stirring the solution occasionally while working it.

We used this form of battery until last season. During the fall, one of our young men of an electrical turn of mind constructed for us a small dynamo, which furnishes a current both for a storage battery which runs the phonograph, and for imbedding foundation. All we have to do is to throw on the belt, and the current is ready at any moment. Of course,

this arrangement is very much superior to the battery, but its cost is twenty or thirty times as much.

THE DOVETAILED OR LOCK-CORNER JOINT IN BEE-HIVES; IS IT A FAULTY CONSTRUCTION?

In the *American Bee Journal*, an interesting series of articles is being written by Mr. Emerson T. Abbott, under the caption, "Production of Comb Honey." In the second article, in the *Journal* for Jan. 24, in referring to the right number of frames for a hive, he shows a decided preference for the eight-frame. Among other things, he says that such a size of hive does away with the necessity of contracting the brood-chamber at any time, and this, he adds, saves the expense of division-boards and contracting. So far we agree. In discussing "the methods of putting hives together," there are some of his points with which I do not agree. "I have been led," he writes, "to wonder a great many times why the so-called dovetailed method has had such a run, as there seems to be some serious objections to it." As one of these objections, he thinks it has been wrongly named, and then proceeds to define the true dovetail. Surely a wrong name is not an objection to the thing itself. Regarding the name, I would say this was originally adopted because it is a term better understood by bee-keepers who have long been used to the same adjective when applied to four-piece sections. Of course, the same objection would apply to the sections. We have, in fact, all along, in referring to the hive in question, called it *both* dovetailed and lock corner; and our 1895 catalog, now ready to be mailed, distinctly refers to it as the dovetailed, or, "more properly speaking, the lock corner."

Mr. Abbott further gives it as his opinion that this joint has nothing about it which renders it superior to the ordinary halved plan, because, he says, "it adds neither strength nor lightness;" and, further, that "it is much harder to set the hives up square, as one has to be very careful in nailing them."

These objections hardly apply to hives of our manufacture—at least, those from our present automatic machinery. And on looking up our records I find that Mr. Abbott has never had any hives of us, of the dovetailed pattern, and I therefore wonder what sort of dovetailed hives he must have had experience with. If he could spend half an hour in our establishment, I'll bet a cooky we could convince him, without a question, that *our* dovetailed or lock-corner joint is far stronger than any halved hive-joint, because *actual tests*, over and over again, have proved it in our shop. By the halving plan the boards bite on each other only half way; by the lock-corner plan the boards bite on to each other the whole way; and added to this is the friction of the fingers, as it were, hugging against each other. By the halved plan, the

strength of the corner depends entirely on the nails; but not so in the lock corner.

I have yet to see a dovetailed hive, when properly nailed, gap at the corners through the influence of the weather, for it is next to impossible; but when the boards are put together by any other plan, a very large percentage (I think I should be safe in saying 50 per cent) after three or four years' time, will show a slight gap, owing to the effects of the weather. In my travels among bee-keepers I have made this a particular point of observation. Moreover, with the bee-keepers in Colorado, California, and in other places where they have those hot winds and a glaring sun, nothing seems to stand so well as the lock corner. These are facts, as I happen to know. Again, we have an unpainted hive of the dovetailed pattern in our yard, that has been exposed to the weather for six years. It is as good as new, so far as the corners are concerned. It shows not the slightest trace of rotting along the notches. There is still another consideration: Dovetailed or lock-corner hives save freight, because four cleats of wood, an inch square, will hold securely 20 sides or ends of the hive, without any additional crating. By the use of our automatic machinery, the expense is very trifling; and this is more than made up by the great saving in crating, in lumber, and time of putting up the hives. It follows, therefore, that, by dovetailing, we save expense to the purchaser.

Mr. Abbott does not like the Hoffman frames. I do not know how much he has tried them; but on this point I recognize that there may be an honest difference of opinion, and in view of this we have for several years back (as we do this year) given our customers the option of a loose unspaced hanging frame.

THE DIFFERENCE BETWEEN FAULT-FINDING AND KINDLY CRITICISM.

I admire the courage of Mr. Abbott's convictions, for I believe that he is honest in them; and I admire, too, that quality in his writings that speaks out plainly, even when they run counter to the views of some of his friends. Indeed, I know he has a very high and warm regard for all the folks here at the Home of the Honey-bees, although he does not see some things as we do. We can always accept the criticisms of friends, and take them in the spirit in which they are written. We all prefer outspokenness far more than outward palaver to the face, and behind the back a dagger-thrust. We here at Medina welcome criticisms that are given in the spirit of kindness, and for the purpose of getting at the truth, and for correcting error; but we ignore those that are manifestly given for the purpose of unloading some pent-up feelings of animosity on the part of those who are constantly *seeking* something with which to find fault. There is a difference—yes, a wide one—between *fault-finding* and kindly criticism.



ON THE WAY TO FLORIDA.

Well, business has been all looked after. I have traveled all over the grounds, from down here the men are cutting ice on the carp-pond, all over the rooms, up stairs and down, through the greenhouses, and given directions for my apartment of the work until every thing seemed done for my six-weeks' absence as well as it could be done.

After half an hour's ride on the cars we were obliged to wait four hours in the evening at Draughton, O., for the train to Cincinnati. Now, we might have sat during the whole four hours in the waiting-room of the depot; but the stove smoked, the room smelled of something more unpleasant than simply coal smoke, and so I told Constance we would see if we could find a place a little more homelike. Just across the track was a hotel, and a pleasant-faced woman seemed to have charge of it. A nice homelike sitting-room was soon placed at our disposal, with easy-chairs, sofa, and pillows—plenty of lamps, carpets, and all sorts of homelike fixings. She said there would not be any charge for simply waiting there until the train came, and even tried to refuse the coin I offered her. I, however, insisted that she should take it. I told her folks couldn't keep a hotel and supply nice warm furnished rooms for nothing. I soon appropriated the lounge and pillow, for I very much needed a nap after my busy day. After my rest I passed the evening very agreeably with two of my favorite agricultural papers, the *Rural New-Yorker* and *Country Gentleman*.

Let me digress enough to say that I have been continually surprised for some time past to see what an exceedingly valuable paper, for high-pressure gardening as well as farming, the *Rural New-Yorker* continues to be. When they put the price down to only \$1.00 a year, it seemed to me next to impossible that it could be kept up to such a high standard of value; but they have held their own so long that it looks as if they were going to keep it up. Although it is weekly in its visits, it seems to me that single issues are frequently worth the price of the whole year.

I presume the average waiting-rooms in our railroad stations are as comfortable as can be afforded under the circumstances; but whenever there is a hotel near I certainly would willingly pay a quarter for the comforts of a home, for two or three hours.

SOME HINTS ABOUT SHIPPING COMB HONEY.

In Cincinnati we made a very pleasant call on C. F. Muth. He and his son are, as usual, busy in the honey-business, and perhaps this is a good time to call attention to the fact that it is risky business trying to ship comb honey during zero weather. Somebody sent friend Muth a shipment, saying that he must have 14 cts. for it. He added, further, that, if any of the honey was broken in transit, Muth should not receive it from the railroad company, but proceed to make them pay damages for said breakage. Now, there are three mistakes in the above method of doing business. In the first place, there should have been some correspondence with Muth before shipping him honey; while in fact, as I understood it, there was none. Muth advertised, as it seems, to pay 14 cts. for first-class white-clover honey; but none of this shipment was first-class, and a consider-

able portion of it was really third or fourth class. Again, Muth isn't in the commission business. He buys outright; therefore it was out of the question to tell him, after it was shipped, that he could not have it for less than 14 cts. Third, no one can make a railroad company pay for honey broken in transit, especially when shipped in zero weather, unless it can be shown that the damage is in consequence of bad handling, and not through any fault of the shipper. Of course, friend Muth could have left the honey in the hands of the railroad company; in fact, I do not know but he renders himself liable in taking it from the depot; but quite a little of it was in such shape that it would have been a total loss if Muth had not taken it, put it in stone crocks, and awaited instructions from the shipper. He told me he would willingly pay the freight and ship it all back to get out of a bad job, if the shipper would accept it.

One reason why it broke out of the sections was that the honey was not securely fastened in by the bees all around. A careful study of the directions for managing, in our bee-journal, would have led the producer to remedy this matter. In fact, very much of the trouble in shipping honey has been on account of lack of attention in this one respect—getting the bees to fasten the honey securely to the wood of the sections clear around. I fear a good many bee-keepers do not understand this, or may be they have never seen a crop of strictly first-class comb honey.

While in Cincinnati we were kindly entertained by the Rev. Norman Plass, former pastor of our church in Medina. He now has charge of the Vine St. Congregational Church, Cincinnati. I was much interested in looking through the church and various rooms for the Sunday-school, Endeavor Society, and other meetings of the young people, and I want to tell you about his

SUNDAY-SCHOOL THERMOMETER.

It caught my eye as soon as I looked into the Sunday-school room, because it seemed to be some sort of scientific instrument. It is simply a piece of wood, in shape, and lettered and graduated similar to a common thermometer-scale, only larger. It is a piece of board perhaps four feet long. Through the center of the board lengthwise a groove is cut about where the glass tube would come in a thermometer. Instead of a glass tube, however, it has a large round cord stretched on pulleys, one pulley at each end of the scale. This cord, half its length, is dyed or painted black. The other half is left white. The superintendent, by pulling on the cord at the back of the instrument, runs what appears to be the column of mercury up or down, and this is the record of attendance. The pupils all watch eagerly to see whether the attendance on any Sunday is high or low, the figures running from zero to 250 or 300°. (In smaller schools, say of 25 or 50, the scale may be made accordingly.) The secretary, after he has counted up the pupils, makes the thermometer show the number present where all can see it, and the high or low temperature, as you will notice, rests entirely on the efforts of the pupils and teachers. If they want to make the mercury to stand high they must bestir themselves to bring as many as possible. While such an instrument may not indicate exactly the *spiritual* growth of the school, it at least approximates it.

When we opened our eyes in the morning we were in the vicinity of Montgomery, Ala.; and as we turned eastward, toward Jacksonville, the deciduous trees began to give place to beautiful varieties of evergreens, pines, and magnolias, with here and there trees of various kinds

draped with the beautiful Spanish moss. Occasionally, also, we got a glimpse of the palmetto, or *Lantana*. Cotton-fields are everywhere; but, owing to the disastrous drouth of last season, a good deal of it was hardly worth gathering. This, in connection with the low price of cotton, might well make our Southern friends feel poor and discouraged. As we look out of the car-window, beautiful little evergreens, less than a foot high, and from that up, greet us at every turn; also a beautiful undergrowth, something in the line of rhododendrons or laurels. All these, with occasional glimpses of the different-colored earth, make up a view various and interesting. I asked the porter if this red earth was not sometimes used for making paint.

"Oh, yes!" he replied; "and one could get enough of it through Alabama and Georgia to 'paint red' the whole wide world."

In this region, cellars seem to be unknown. The houses are set up on blocks or brick piers, so that the wind can blow clear through underneath. Well, perhaps they have no need of cellars to keep things from freezing; but I am sure I should want a cellar in which to keep things cool, and to keep potatoes, apples, etc., from wilting. Another thing, a cellar is perhaps more convenient where room is scarce, and a basement can be made without any expense for roofing. Out in the country most of the buildings, especially the humble ones, are entirely destitute of windows. The only way they have of getting light is to leave the doors wide open; and even on this 17th day of January, in the middle of the winter, the doors are open everywhere. May not this fact of abundant ventilation account for the claim so often made, that, in many parts of Alabama and Georgia, people never die of consumption? that is, they never have it unless they contract it somewhere else. The chimneys are invariably built on the outside of the cheap houses in this country.

For some time I was puzzled to know the purpose of a small light ladder that stood near the chimney. I finally decided that it was to afford access to the loft. When it is time to put the children to bed, all that you have to do is to go outside and climb up the ladder, and this gives more room inside.

PLANTING ON HILLSIDES TO PREVENT WASHING.

I am delighted to find that the corn, cotton, and almost every other crop, is planted on uneven ground, so that the furrows curve around the hillside instead of straight up and down. This is to prevent the terrible washing and cutting that occurs when the water is allowed to go straight down hill. The plan is exactly that recommended by friend Day, in the tomato-book; and in some places we see, every little way down the decline, a deeper furrow or ditch to take away the surplus water before it can accumulate and break over the furrows. Where the crop is clear over the top of the hill, the furrows circle right around the hill-top. In fact, wherever the ground is at all rolling we see these curved furrows left by the cultivator. Where this precaution is not taken, the fields are cut up and ruined. Now, this running the furrows across the hillsides has a value aside from preventing washing. During seasons of excessive wetness it takes the water off before it can be detrimental to the growing crops. It also enables the ground to dry off quickly, so that cultivating may go on speedily, and even where clay soils have been most thoroughly underdrained (the underdrains, of course, running straight up and down the hills), these surface-furrows have a great value.

THE ROSIN AND TURPENTINE FORESTS NEAR THE LINE BETWEEN ALABAMA AND GEORGIA.

I should judge we must now be in the heart of this industry, from the number of barked trees. The bark has been scraped off to get the rosin. As nearly as we can gather from looking out of the car-window, the rosin oozes out like gum from peach-trees where the bark has been removed. When sufficient has accumulated they evidently scrape it off by some means. We have not seen them doing it yet; but we see barrels and barrels of rosin at every depot; and along at the houses the people are boiling something out of doors in iron pots. Now, we can't discover whether they are cooking a dinner or boiling rosin. Will somebody from this region tell us about it? In some of the pine forests we see notches cut in the trees so as to make cavities; and I judge they dip the turpentine out of these cavities. Now, do both turpentine and rosin come from the same kind of pines? Will somebody straighten us out in regard to this industry? There are miles and miles of these scarified trees, the rosin on the trunks making them look white, like some immense cemetery.

All through Georgia we have been struck by the beauty of the pine forests. In some places the trees are as straight as arrows, about as close as they can grow, and of wonderful beauty and regularity. No wonder Georgia has been celebrated for its cypress and pine timber. But it seems to me that a good deal of it is going to waste shamefully. The trees are girdled, simply that they may plant corn and cotton between them, and then are allowed to stand until they rot and tumble down—for the reason, I suppose, that it is less trouble to let them stand than to have them down in the way of cultivation. If these beautiful trees are of no value now, they certainly will be in the near future. Some of the finest timber we have seen is in the vicinity of Bainbridge, on the Flint River.

KIEFFER PEARS.

Georgia has of late been coming to the front grandly in the line of fruit-growing, especially peaches and pears. All about Thomasville and beyond we see acres of large pear-orchards, of wonderful beauty and luxuriance. I judge them, by the looks, to be the Kieffer.

LETTER TO HUBER.

We have just passed a station, Huber, which is called "Dixie." You don't remember any thing about the old war-time song called "Dixie Land;" but I think mamma can tell you something about it. Here is a verse:

In Dixie Land, where I was born,
Early on one frosty morn,
Look away, look away,
Look away to Dixie Land!

Chorus—

Den take me back to Dixie,
Hooray! hooray!
In Dixie Land I'll take my stand
To live and die in Dixie;
Hooray! hooray!
To live and die in Dixie.

Well, Huber, what do you think of that? I do not wonder the Southern people were so enthusiastic about Dixie Land, especially if it was as beautiful then as it is now. I tell you, Dixie Land is just what you'd call "slick." The rays of the afternoon sun, as they strike the brilliant green of the pines, palmettoes, and live-oaks, give a view that is grand indeed; and the water along the side of the track makes a reflection like a great looking-glass. The water is so clear and dark and still, in fact, that the

fection is almost equal to the reality.* Taking it all in all, I am sure you would give your verdict in your most emphatic way, that Dixie Land is "just slick." Constance says the luxuriant tropical foliage is beautiful with all the hues of the rainbow; but you see I am a trifle color-blind, and don't see much except the brilliant shades of green. It is not only the vegetation that is radiant with brilliant colors; but even the *ground itself* here in Dixie Land shines out with many tints, running all the way from white and gray and yellow sand to the brightest orange and vermillion. You see, it is this funny, sandy soil. In some places the roads look as if they were sprinkled with salt. It is only the patches of white sand sprinkled in with the rest. Wherever we see this white sand, especially where it is trodden down hard by the bare feet of the little colored boys and girls, I tell you the wheeling would be "just slick" too if I could get out to try it. And, by the way, these little colored people, with their white frocks contrasting with their shining black faces, furnish another bright element in the picture. There are free schools for these little colored people, and I rather think that is one reason why their faces look so bright and happy. It is summer time down here, even if it is the middle of January, and these children are not only barefooted, but, for the most part, barelegged. As we go past on the cars everybody is either standing in the door or outside the door.

While passing through Kentucky a sick man came on board the train with his family. His wife informed me that he was a broken down clergyman, suffering from nervous prostration, on his way to Florida. I did not talk with him until we were near Jacksonville, as I feared it might aggravate his trouble to see strangers. An accident, however, opened the way; and when I introduced myself he replied something as follows:

"My dear sir, I am delighted to make your acquaintance; for, to tell the truth, I have gotten acquainted with you already from overhearing you dictate to the young lady. I could not well help listening; and the more I listened, the better I felt satisfied that it was intended for the great public ear. I heard you tell about the smell in the waiting-room that was something worse than coal-gas, and I was very much interested in the Sunday-school thermometer."

We exchanged experiences, and I believe I gave him faith and hope, besides some ideas of my own in regard to "doctoring without medicine." His wife's aunt accompanied them, and I was greatly interested in her because she was born blind. After hearing something of her from Constance I introduced myself, and she invited me to sit down by her side. She can not tell the difference between the broadest daylight and the darkest midnight; has no perception at all of shade and shadow. Of course, she can feel the heat of the sun, and is unusually sensitive to all these influences. She has no idea of color or brightness excepting what is told her. Said I, "My good friend, if you succeed in being happy and thankful while you are for ever shut out from sight and light, how ill it becomes us to complain of our lot, especially when this great affliction is no fault, in any sense, of your own. Some in your condition might complain, and with quite a show of reason, that the great Father above is unfair. You remember, of course, the disciples asking the Savior, 'Whose fault is it, this man's or his parents', that he was born blind?'"

* Cousin Louise has told me since that it is the roots of the palmetto that dye the clear water black, or dark colored, so that it reflects the landscape almost like a polished steel mirror.

She caught hold of the idea quickly, and replied, "Oh, yes! and I have often thought of his answer, that 'it was through no fault of the man or his parents, but that the will of God might be made manifest.'"

Then I suggested that the great lesson to her was to have faith to believe that God had some plan or purpose, even in her case, to manifest to the children of men his wondrous providences. I shall always remember how that expressive face, even despite the sightless eyes, brightened up as it seemed to look up and grasp for faith. As I dictate, the words come into my mind:

My faith looks up to thee,
Thou Lamb of Calvary, Savior divine.

I suggested that her darkness was not to be compared with that of those who, "having eyes, see not; and having ears, hear not," and she at once replied that she by far preferred her lot in life to the darkness of sin and a guilty conscience, and without the light of the gospel.

She had heard of Helen Keller, and I promised to send her the book telling all about Helen's wonderful experience. She said her niece's children were quite ready and willing to read to her. If any of you wish to address her, send in care of G. W. Yancey, Ocoee, Orange Co., Fla. Perhaps I may mention that her mother was exposed to the measles, and took it shortly before her birth, and thus a human life of darkness.

As I sit out on the veranda which opens out from my pretty little bedroom in Jacksonville, Fla., the bees are humming in the soft-maple blossoms that spread out almost within my reach. I sat here in my shirtsleeves, and penciled a card to my old mother before 10 o'clock in the morning. When I left Medina a good many urged me to leave my wheel at home, as I could never make a bit of use of it in Florida. Even Ernest (and I am surprised at him) suggested that it would be more trouble than it would be worth, from all the reports he could gather. But as soon as my wheel was uncrated I took it to carry my postal to the letter-box, and found out by somebody that there was a brick pavement a little way off. I reached there by means of the sidewalks. Then I ran up past the waterworks, where three artesian wells were pouring forth beautiful water, looking much like those wells I described on my Missouri trip.

About this time I struck a shell road, and, under the inspiration of this beautiful track, the exhilaration of the springlike air, and encouraged by the chirping of the tree-toads, I declared to myself that I would follow that shell road wherever it wended, even if it took me twenty miles or more. Why, I never saw a finer wheel-track in my life. The graveled pikes in Western Ohio are in no respect better—hardly equal—because they are not on such a dead level. One can ride miles without touching the handle-bar at all.

After a trip of about five miles, curving around through beautiful piny woods, palmettoes, magnolias, and various glossy-colored underbrush, I came to the Jacksonville cemetery. As it was near the dinner-hour, after a hasty trip through the grounds I sped me home again, and made the trip of five miles in just 17½ minutes, besides getting lost; and I might have been considerably longer had not Constance called to me from the aforesaid balcony above, asking me why I was spinning right *past* the house where I lived. Now, others may say what they please; but I for one think it pays to take a wheel along on a Florida trip, just for the beautiful rides around Jacksonville, even if there shouldn't be any thing like it in any of

the other towns. When I reached the end of the shell road, at one point I tried my hand at wheeling through Florida sand. I was obliged to give it up; but a lady informed me that the sand *here* was not a circumstance to what I should find in South Florida. On a pinch I could make better speed than to walk; but it was pretty hard work, if followed any length of time.

THE ARTESIAN WELLS OF JACKSONVILLE.

As I started out early one morning to make explorations I noticed a place for watering horses; and as the water came out of the iron pipe it seemed to be steaming. On touching the pipe I found it quite warm. The water, too, seemed to be toward 70°. Later in the day I visited the artesian wells. There are three of them. The two first that were drilled were put down to a depth of 600 or 700 feet. The last one, which gives the largest volume of water, is down to something over 1000 feet. The constant temperature of the first two is about 70°, while the deepest is a little over 80°. Now this, you see, is warmer than we need our living-rooms; and, in fact, warm enough for tropical plants in a greenhouse. But no one has ever yet, that I know of, made use of this great storehouse of heat, to warm buildings, to grow plants, or any thing of this sort. Why, I should regard it as a mine of wealth for the purpose of giving an absolutely even temperature; and, by the way, I have not as yet found any thing around Jacksonville, in the way of market-gardening or growing vegetables, worth mentioning. There is just one little dilapidated greenhouse, and this is used only for flowers. Why don't people make gardens where the bees are buzzing in the soft maples, and the temperature seems to be just exactly right for many hardy vegetables? I said to the engineer of the waterworks, "Why, where does this water come from? It's away up above the ocean, and away above the St. John's River. Is there no elevated body of water anywhere around that could furnish a supply of water for these wells that have been running for so many years?"

"Well, sir, this is a secret that no man has ever yet found out. There is no elevated body of water, and, for that matter, scarcely any elevated land anywhere near. There have been conjectures by scientific men that this water stratum extends clear up to the Cumberland Mountains; but this, of course, is mere guesswork."

This water as it comes from the wells is like that at Clinton, Mo.—sulphurous; and the bottom of the reservoirs and overflow streams is decorated with all the colors of the rainbow. I supposed it was from the minerals it contained; but my friend the engineer explained: "Not minerals, Mr. Root, for this is almost absolutely pure water. These beautiful colors are the result of a species of moss, or algæ, and this vegetable growth takes place only where the water is exposed to the sunlight. See here; we have one reservoir roofed over and bricked up so as to make it dark like a cellar. There is none of this growth in this reservoir at all; but where it is exposed to the full sunlight it grows very rapidly. It commences on the stone or sand at the bottom, where the sun can strike, and gradually breaks loose and floats away, the warm temperature, 70 or 80°, greatly facilitating this vegetable growth. Here at the wells the water has a strong, sulphurous taste;

but after exposing it to the air as it pours over through the fountains, this odor at last disappears. You will notice, when drawn from the hydrants in the city, it seems to be pure water, with scarcely any taste of the sulphur at all." Now, you see we have at least a partial explanation of the wonderful mossy covering of the ponds of spring water in Castalia, Erie Co., O.; and here is a solution, too, of the cause of the mossy growth and covering surrounding the watering-troughs and streams from springs throughout our land. Put a box or tub around your spring, either of stone, brick, or wood, then have a hinged cover over it to lift up, and you won't have any of this slimy moss or scum. All you have to do is to keep away the sunlight, and it can't grow. One of the agricultural papers recently stated that whitewashing a watering-trough, or even placing a lump of lime in the water, would keep away the moss. You see the idea is, that the moss is a vegetable growth, and propagates itself, and grows in the spring water, simply because this water furnishes the desired temperature, especially where it flows out into the sunlight. And this slimy moss, then, really is not found at all, nor even the *elements* that go to *make up* its growth, in the water itself, as it comes from the ground or rocks. I am glad to know this, for I had a sort of notion that the water was not pure where this sort of deposit was all along the outlets of the spring. And, by the way, may not this mossy substance be utilized? At Castalia great quantities of snails breed in it as it floats on the surface of the still water in the ponds; and ducks may be reared in immense quantities, getting almost their entire sustenance from the snails on the water. Peter Henderson speaks of cocoanut fiber being a valuable material for mulch, and for incorporating with certain soils in raising crops. I am of the opinion that this mossy substance floating on the ponds would be still more valuable. In Castalia there was not only wagonloads but carloads of it, which I presume the people would be glad to get rid of. If thrown upon the banks until dried out, it certainly would be a splendid absorbent to be used in stables, making our ponds and streams look more tidy besides.

JACKSONVILLE.

This is a very pretty city of nearly 30,000 inhabitants, and is the largest in the State. At the present time there is a very general activity all over the place in putting in good substantial street pavements. The cedar-block pavements are being removed, and either vitrified brick or cement put in its place. The cement pavement is made of material found only about 25 miles away, and brought in by boats. It seems to be a sort of limy marble; and when mixed with sand it resembles hard putty, and pounds down into material that is something like hard wax. They claim that, when once packed and rolled, it will turn off rain; and I should think that, with some attention to keep it in shape, it might do this.

There are plenty of churches here; and, judging from the sermons we have heard, their ministers are educated and able, and fully up to the times. Their audiences are made up also of people of intelligence and culture. For once in my life I have attended church where the ventilation seemed proper, especially for such a climate. There were very large windows, which were opened so that the church seemed like a great airy veranda; and those who were tempted to stay away from the service because of the enticing air and sunshine out of doors had certainly no reason to call the church close or confining. Endeavor Societies and Sunday-schools also seem to be doing effective work. The city is very quiet and orderly on Sunday.

*Another thing, where does this 80° of heat come from, 1000 feet below the surface? Is it possible this high temperature and the elevation of the water are in some way connected? If the water were forced up by steam, however, would it be possible for the water-pressure to remain so perfectly even, year in and year out?

Places of business were generally closed except the fruit-stands and drugstores. Besides the churches for the white people, those for our colored friends seemed ample and well attended. I never before saw so many *motley dressed* colored boys and girls. These people as a rule seem busy and industrious all through the city.

All around the depot, and on the principal streets, Jacksonville is *indeed* a busy place. In fact, to accommodate business traffic an immense structure, a real viaduct, spans all the railroad tracks, and connects Riverside with the principal streets of the city, leaving the track-yards unobstructed for the railway traffic. On this viaduct one may see crowds of people on foot, with teams and street-cars passing to and fro almost every hour of the day. In our northern cities at the present time we see very little building going on; at least, there are few structures being put up of any considerable size. But here there are not only an immense number of fine dwellings, but a large union depot is under full headway in process of construction. The terrible frost, that has been such a severe setback to many of the great Florida industries, seems to have had little effect in stopping improvements here.

SOMETHING GOOD FROM CANADA.

We notice, by the *Practical Farmer* of Jan. 5, that T. B. Terry has been invited over to the Queen's domains. We make the following extract:

One of the pleasant features of the meeting was a banquet. At 6 P. M. we moved from the hall, where the work was done, to a great room where numerous tables were loaded down with good things to eat, besides being most beautifully decorated with flowers, etc. As I walked through this beautiful spread, at the head of the procession, with the wife of my esteemed friend, President Mills, on my arm, I thought that farmers were certainly most highly honored in Canada; and when it came to drinking (water) to the health of the Queen, I know that I did it as heartily as any one there. About 300 were seated at this feast, and eating and toasts, and speeches and merriment, made $3\frac{1}{2}$ hours pass away very quickly.

Allow me to say the above is tiptop; but here is something of more special interest to bee-keepers, for it concerns the president of the N. A. B. K. A.:

I feel particularly indebted to one of my best friends, Sec. Holtermann, for giving me a chance to see all these things with my own eyes and hear them with my own ears. Somehow we do not get a full idea from reports issued by the Society. They are too modest.

T. B. TERRY.

HITCHING-POSTS IN THE MIDDLE OF TOWN.

Inasmuch as I have had my say recently in the matter it may be best to give the following from the *Massillon Independent*:

MIGHT NOT WORK.

A little reform in the matter of hitching horses in the business center would be gratefully accepted by everybody. It could be accomplished without giving offense to anybody, by the exercise of tact on the part of—say, the police force. A personal request, for instance, to move on to some side street, would in time cause country visitors to accustom themselves to a change of habit, and the business streets would be made much freer for traffic.—*Massillon Independent*.

Replying to the above, the *Wadsworth's, O., News* says:

That thing was tried in Belvidere, Ill.; and then the country visitors politely told the city dads that, if they were not allowed to hitch on the principal street, they would go elsewhere to trade.

[To which I wish to add, "Good for the 'country visitors.'" Let the "city dads" have the town all by themselves, after their own fashion, and see how they like it.—A. I. R.]



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